	Product Description	Mechanism of Action	Germicidal Efficacy	Contact Time	Gaps in Activity Spectrum	Health and Safety Profile	Environmental Profile	Cleaning Efficacy	Material Compatibility*
Accelerated Hydrogen Peroxide	Synergistic and patented blend of Hydrogen Peroxide and Anionic Surfactants. *All ingredients appear on the EPA GRAS (Generally Regarded As Safe) listing and/or the EPA Preferred Inerts Listing.* ACCELERATED HYDROGEN PEROXIDE	The accelerated activity of AHP is the outcome of a unique synergy between Hydrogen Peroxide and a number of other ingredients including surfactants and sequestering agents. This synergy greatly increases the kinetics of the action against pathogenic organisms and reduces the time required to render the solution cidal. Even though the exact mechanism of action for AHP is unknown it is believed that AHP acts by: 1. Disrupting the cellular membrane permeability, inhibiting the enzymatic activities, and denaturing cellular proteins. 2. The reaction of the superoxide ion with H2O2 forms hydroxyl radical. The Hydroxyl radical, being highly reactive attacks membrane lipids, DNA and other essential cell components. 3. Sequestration of bivalent cations resulting in subsequent disruption of cellular structure and functions. 4. Alteration of the proton motive force responsible for species transport across the cellular membrane. It is believed that oxidizing actives will not allow for resistance development when targeting organisms.	**Gram Positive and Gram Negative Vegetative Bacteria (0.5 % $^{w}/_{w}$):** *Pseudomonas aureginosa* **ATCC 15442** *Staphylococcus aureus* **ATCC 6538** *Salmonella choleraesius* **ATCC 10708** *Staphylococcus aureus MSRA* *Enterococcus faecalis VRE* **ATCC 51575** *Escherichia coli* *Acinetobacter baumanii* **Viruses -Enveloped and Non-Enveloped (0.5 % $^{w}/_{w}$) :** *Polio Virus Sabin Strain Type I* **ATCCVR 192** *Human immunodeficiency Virus Type 1* *Human RhinovirusType 14* *Human Rotavirus* *Feline Calicivirus(Noravirus surrogate or Norwalk-Like Viruses)* **Fungi:** □ **AHP (7 % $^{w}/_{w}$)** □ **AHP-TB (2%)** □ **AHP-TB (0.5 % $^{w}/_{w}$)** ATCC 9533 *Trichophyton mentagrophyte* **Mycobacteria:** □ **AHP (7 % $^{w}/_{w}$)** □ **AHP (2%)** □ **AHP-TB (0.5 %)** ATCC 15755 *Mycobactarium terrae* **Spores (7 % $^{w}/_{w}$):** *Bacillus subtilis* **ATCC 19659** *Clostridium sporogenes* **ATCC 7955** ***Reference: Centre for Research on Environmental Microbiology, CREM, University of Ottawa***.	**<u>Sanitizer 99.999% 5-log (30 seconds)</u>** Broad-Spectrum approval, Bacteria including MRSA, VRE **<u>Disinfection: (1-5 minutes)</u>** **Broad Spectrum Bactericidal Approval** **99.9999% 6-log$_{10}$ Reduction:** Accel TB: **<u>General Virucide Claim (1-5 minutes)</u>** **99.99% 4-log$_{10}$ Reduction** (based on proven effectiveness against Polio Virus Sabine Strain as selected surrogate by Health Canada): **<u>Fungicidal (3-5 Minutes)</u>** **99.999% 5-log$_{10}$ Reduction:** **<u>High Level Disinfection: (1-20 min)</u>** **Mycobactericidal:** **99.9999% 6-log$_{10}$ Red.on Instruments** **99.99% 4-log$_{10}$ Red. on Surfaces** **<u>Sterilization:</u>** **Sporicidal** **99.9999% 6-log$_{10}$ Reduction** Instruments: 20 minutes Surfaces: **10 minutes** *Note:* *These contact times have been established by microbial testing as required by the Disinfectant Drug Guidelines - 1999 Edition, Health Canada*	None	**0.5 % AHP** Non Irritant to Skin according to OECD 404* (Nucro-Technics Inc, 1999) Non Irritant to Eyes according to OECD 405 at use dilution (Nucro-Technics Inc, 1999) Acute Oral Toxicology, OECD 420, indicated LD$_{50}$ > 2.0g/Kg (Nucro-Technics Inc. , 1999) VOC –Free (free from Volatile Organic Compounds), studies on file Ortech Inc., below detection limits. No-Fragrance, No-Dyes **0.5% AHP - TB** Non-irritating to Skin according to OECD 404* (Nucro-Technics Inc, 2003) Non-irritating to Eyes by OECD 405 * (Nucro-Technics Inc, 2003) Acute Oral Toxicology, OECD 420, indicated LD$_{50}$ > 2.0g/Kg (Nucro-Technics Inc. , 2002) Category IV-The Environmental Protection Agency (EPA), does not require any precautionary statement on the label.	**0.5 % AHP** Biodegradable according to the OECD 302 B (Inherent Biodegradability Test) Products are not manufactured using APE (Alkyl Phenyl Ethoxylates) or NPEs (Nonylphenol Ethoxylates) which have been worldwide classified as "Endocrine Disrupting Chemicals": *Canadian Environmental Protection Act (CEPA) - Priority Substance List PLS2* Low Toxicity Profile to Aquatic Species: Rainbow Trout Toxicity 96h LC$_{50}$ = 1.77 ml/l Daphnia Magna Toxicity 48h EC$_{50}$ = 0.37ml/l	**0.5 % AHP** Excellent: 86.5% Cleaning Efficiency according to the Canadian General Standards Board, Standard CAN/CGSB 2.11- Method 20.3	Avoid prolonged exposure to: Copper, Brass, , Lead, Chrome, Nickel and other soft metals.

Aldehydes	The two most important aldehydes in this group are Formaldehyde and Glutaraldehyde. Formaldehyde is rarely used as a disinfectant now a days, due to great concerns over its toxicity and its inclusion on EPA inert list 1. Glutaraldehyde (1,5-pentanedial) is usually supplied as an amber-colored liquid of acidic pH. For disinfection purposes a 2% solution is normally supplied, which must be "activated" (made alkaline) before use. Aqueous solution of glutaraldehyde consists of free glutaraldehyde, the cyclic hemiacetal of its hydrate and oligomers of this in equilibrium. Polymers in the alkaline range are unable to revert to monomer phase, therefore solutions in alkaline pH lose activity rather quickly (14 days). OPA is a 0.55% ortho-phthalaldehyde which does not require activation before use.	Glutaraldehyde reacts predominantly with amino groups in proteins and enzymes. Because of its interaction with amino groups, it will bind to important components in bacterial cell envelopes, e.g. proteins, peptide chains in peptidoglycan and the teichoic acids in the cell walls of Gram-positive bacteria. In Gram-negative bacteria, glutaraldehyde interacts principally with outer components of the cell, notably lipoprotein. Furthermore, release of certain membrane-bound enzymes is prevented by glutaraldehyde treatment. Glutaraldehyde effects mature spores by interacting with the spore surface, and by penetration into the spore. It can also affect spores in Germination and out-growth stages.	Gram Positive and Gram Negative Bacteria Viruses (Enveloped and non-enveloped) Fungi Mycobacteria Spores (OPA is not sporicidal) Protozoa *Reference:* *Inhibition and destruction of the microbial cell, W.B. Hugo*	**Efficacy of 2% alkaline glutaraldehyde solution:** Vegetative bacteria: 4 minutes Mycobacteria: *Mycobacteria terrae*, 60 minutes, 5 log reduction Viruses: Polio types I&II, 10 minutes Bacterial Spores: *Bacillus Subtilis*, 3 hours **Efficacy of 0.55% ortho-phthalaldehyde (OPA):** Vegetative bacteria: 5 minutes Mycobacteria: 12 minutes Viruses: 5 minutes Bacterial Spores: N/A (No claim) *Reference: Disinfection, Sterilization, and Preservation, Fifth edition, S. S. Block* *Reference: Handbook of disinfectants and antiseptics, Joseph M. Ascenzi*	There is concern over efficacy of glutaraldehyde against biofilm formed on flexible endoscopes in automatic machines. Development of intrinsic organism resistance. Reference: Carson et al. Growth characteristics of atypical mycobacteria in water and their comparative resistance to disinfectants. *Appl Environ Microbiol* 1978; 36: 839-846 Recurrence of spores. Studies have shown that a spore population of *B. Subtilis* treated with alkaline glutaraldehyde, and presumed dead, can be revived. Reference: Gorman SP, Hutchinson EP, Scott EM, et al. Death, injury and revival of chemically treated *Bacillus Subtilis* spores. *J Appl Bacteriol* 1983 54: 91-99 0.55% OPA showed only a 0.5-log reduction in spores of *Bacillus Subtilis* after 12 hours.	An increasing number of reports of toxic reactions in both the ICP (Infection Control Personal), and the patients exposed to equipment treated with glutaraldehyde, has resulted in growing concern about glutaraldehyde use, and the efforts to replace them. Recently, the upper limit for glutaraldehyde in workplace atmospheres was reduced from 0.2ppm to 0.005ppm (American Conference of Government Industrial Hygienists, 1995; BSGEC, 1998). Short term (acute) effects: contact with liquid and vapor can severely irritate the eyes, burn the skin. Breathing glutaraldehyde can irritate the nose, throat, and respiratory tract, causing coughing and wheezing. Exposure to Glutaraldehyde can cause nausea, headaches, drowsiness, and dizziness. Long-term (chronic) effects: glutaraldehyde is a sensitizer. This means some workers will become very sensitive to glutaraldehyde and have strong reactions if they are exposed to even small amounts. ICP may get sudden asthma attacks with difficult breathing, coughing, and tightness in the chest. Prolonged exposure can cause a skin allergy and chronic eczema, and afterwards, exposure to small amounts produces severe itching and skin rashes. Glutaraldehyde is a suspected mutagen and carcinogen. OPA has a somewhat better Health profile than Glutaraldehyde due to its higher vapor pressure. However OPA in contact with skin causes a black stain.	Glutaraldehyde can cause massive killing of bacteria or the ecological microbial flora upon release to the environment (especially systems with a septic tank).	Poor Glutaraldehyde and OPA cause the fixation of proteins to the surface, making them harder to remove. OPA stains the proteins.	Corrosion & electrolytic deposition may occur if instruments of different metals are immersed together.

***Always check material compatibility with manufacturer before using.**