PERASHOCK®

PERACETIC ACID

LEGA MIDDLE EAST

Peracetic acid solutions for disinfection and oxidation

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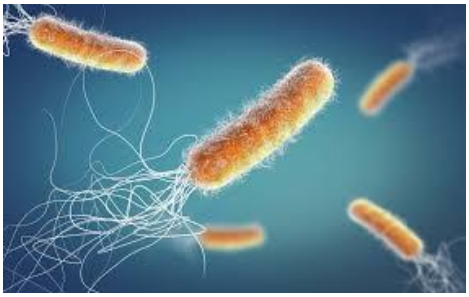
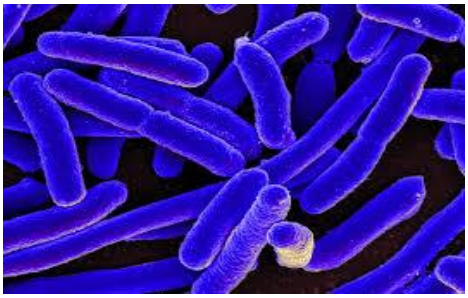
Pseudomonas aeruginosa



Escherichia coli



Enterococcus hirae

Staphylococcus aureus

What is Peracetic Acid?

Peracetic acid ($C_2H_4O_3$) is a mixture of Acetic Acid (CH_3COOH) and Hydrogen Peroxide (H_2O_2) in a watery solution. It is a bright, colorless liquid that has a piercing odor and a low pH value (2,8). Peracetic acid is produced by a reaction between hydrogen peroxide and acetic acid.

Peracetic acid has outstanding disinfectant properties and acts as a potent antimicrobial agent, even at low concentration. It is effective against bacteria, yeasts, molds and virus.

The reason for the excellent and rapid antimicrobial effects of peracetic acid is the specific capability to penetrate through the cell membrane. In the cell, peracetic acid irreversibly disrupts the enzyme system, which in turn leads to destruction of the microorganism. Peracetic acid is used mainly in the food industry, where it is applied as a cleanser and as a disinfectant. Since the early 1950's, acetic acid was applied for bacteria and fungi removal from fruits and vegetables. It was also used for the disinfection of recycled rinsing water for foodstuffs.

Nowadays peracetic acid is applied for the disinfection of medical supplies and to prevent biofilm formation in pulp industries. It can be applied during water purification as a disinfectant and for plumbing disinfection.

Peracetic acid is suitable for cooling tower water disinfection; it affectively prevents bio film formation and controls Legionella bacteria.

FOOD & BEVERAGES INDUSTRY

Disinfectant

PeraShock® is known to be highly effective for biocidal applications in the food & beverage industry.

It is used to disinfect or sterilize equipment, surfaces, tanks, pipes and plastic bottles.
It is a standard procedure to use PAA in CIP- or SIP-installations in food & beverage processing applications, as a cleaning or sterilization agent.

Cleaning & disinfection are part of fixed regulations. Every single procedure is designed to meet the strict hygiene rules.

There are so many types of products which are packed in plastic bottles made of PET or PE in food & beverage industry. Juices, soft drinks, tea and liquid dairy products processing needs to have perfect hygienic conditions during the packaging process to provide a long shelf life.

Sterilizing the packaging material with peracetic acid solutions or vapor in the rinsing step of the bottle filling line is used for aseptic cold filling to protect beverages along the production chain.

POULTRY FARMS & VETERINARY

Animal health

In the meat production industry, antimicrobials such as chlorine and peracetic acid have been shown to be very effective at reducing pathogen levels if applied directly to the meat, and in the U.S., they are now being used for direct intervention. Peracetic Acid is highly effective in very low concentrations even at low temperatures and/or in presence of organic impurities. Applications include general surface and equipment disinfection, treatment of water supply systems and thermal fogging.
It is also used as a surface disinfectant to clean and disinfect the surfaces to avoid diseases in livestock.

The diluted solution is applied by mechanical sprayers or pressure washers. As the water systems usually contain bacteria, our PeraShock cleans the system and eliminates growth of bacteria.

MEDICAL USE

Sterilizer & disinfectant

Peracetic acid is a highly biocidal oxidizer that maintains its efficacy in the presence of organic soil. Peracetic acid removes surface contaminants (primarily protein) on endoscopic tubing.

An automated machine using peracetic acid to sterilize medical, surgical, and dental instruments chemically (e.g., endoscopes, arthroscopes) was introduced in 1988.

Typical uses of peracetic acid in medicine includes disinfection of medical equipment, cold sterilization of dentures, plastic implants, syringes, thermally sensitive nutritive media, disinfection of hemodialysis systems and decontamination of liquid and solid medical wastes in hospitals.

AGRICULTURE

Disinfection & slimicide

Due to high population growth, a highly efficient agriculture sector becomes very important nowadays. As per the current trend of proper resource management in agriculture business, many open fields switch from traditional flood irrigation to more efficient drip irrigation. One of the major problems in drip irrigation is the clogging of tubes and emitters due to biofilm formation.

As for greenhouses, apart from drip irrigation systems, they also use peracetic acid either as a shock treatment or regular disinfectant in order to fight pathogens that can be found on any surface. It also works great in disinfection of fruits or vegetables that can extend their shelf life. Peracetic Acid solutions are highly effective and environment friendly biocide in agriculture. Pulse cleaning of drip lines in the absence of plants, disinfection of tools, tables and containers as well as washing of harvested goods with peracetic acid are typical examples of the broad range of possible applications.

The main applications are:

- Washing water for potatoes
- Washing water for fruits
- Irrigation water (surface, rain and spring water)
- Greenhouses and other horticulture purposes

The concentration of peracetic acid depends on the specific requirements in the respective application. It is advisable to adapt the concentration on the basis of corresponding microbiological tests. The product is suited to kill harmful organisms such as Soft Rot (Erwinia Carotovora) and Brown Rot (Ralstonia Solanacearum). After disinfection peracetic acid decomposes into ecologically harmless residues such as water, oxygen and acetic acid.

LAUNDRY
Disinfection

In the chemo-thermal disinfection of laundry, especially originating from hospitals and other medical care institutions, peracetic acid products are used in the washing stage as a disinfectant and bleaching agent.

The specially designed ratio of peracetic acid to hydrogen peroxide gives a strong positive effect to the stability of the peracetic acid in the washing liquor, this results in a bleaching effect along with a high level of disinfection.

CHEMICAL SYNTHESIS

Oxidizing agent

Strong oxidative power, high stereo-selectivity as well as non-radical reaction pathways determine the use of peracetic acid in industrial preparation of various important intermediate products. Peracetic acid is frequently used for the synthesis of organic S-oxides in the pharmaceutical industry and in the manufacture of cephalosporins-antibiotics from penicillin. Peracetic acid is also used in a wide range of oxidation reactions such as:

- Epoxidation of olefins
- Selective epoxidation of various unsaturated compounds
- Oxidation of thioethers to sulfoxides or sulfones
- Oxidation of tertiary amines to amine oxides
- Oxidation of pyridines to pyridine oxides
- Oxidation of ketones to esters or lactones

In all these reactions peracetic acid has many advantages over other oxidants, since the reduction products can be easily removed and the oxidation products are thus obtained in high yield and purity.

ENVIRONMENTAL

Disinfection & slimicide

Formulations of peracetic acid are effective against a wide range of harmful aquatic organisms and to those which cause problems in industrial processes. Peracetic acid solutions are used for a wide range of water treatment applications such as the treatment of cooling water and industrial or municipal waste water. Waste water is usually disinfected prior to discharge to remove pathogenic species. Products containing peracetic acid offer an alternative to common chlorine-based disinfectants such as sodium hypochlorite. Utilization of a chlorine-free disinfectant prevents the formation of toxic chlorinated side products. Cooling with water is widely used in industry, power stations and various plants. Algae and a large number of bacteria species can grow in cooling circuits and produce slime which rapidly forms deposits and results in clogging problems. Moreover, the slime can also activate the development of other corrosive bacteria. Furthermore, mussel larva entering cooling systems can grow up to palm size, thereby causing enormous operational problems in industrial cooling circuits. Adding peracetic acid to the intake water stream prevents the microorganism from growing to adult species and reduces therefore the plugging of the heat exchangers and the cooling system as the whole. The dosage amount of the peracetic acid is adjusted experimentally to treat the water throughput requirements.

PRODUCT GRADES

Our peracetic acid is produced in several dilutions, starting from 1 to 40% concentrations. The product is marketed under a brand name- PeraShock® in all regions, where it is represented and carries numbers depending on the grade. For grades and their applications, you can refer to the table no. 1

Table 1. PeraShock® grades and their applications

APPLICATION	PRODUCT
PHARMA COSMETICS CHEMICAL SYNTHESIS	PeraShock® 35 PeraShock® 40
HEALTH CARE MEDICAL DEVICES	PeraShock® 0.1 PeraShock® 0.25 PeraShock® 0.4 PeraShock® 1 PeraShock® 5
POULTRY FARMS/VETERINARY	PeraShock® 5 PeraShock® 15
FOOD & BEVERAGES/FOOD PROCESSING	PeraShock® 5 PeraShock® 10 PeraShock® 15
WATER TREATMENT/LAUNDRY	PeraShock® 5 PeraShock® 10 PeraShock® 15

LABELING

According to Global Harmonized System (GHS) and the European Regulation No. 1272/2008 aqueous solutions of peracetic acid are dangerous substances and therefore must be labeled and handled correspondingly. The exact classification of the particular product depends on the concentration of peracetic acid and hydrogen peroxide. The table below represents the classification of the selected products. Please refer to the material safety data sheet of the corresponding product for its exact GHS classification.

PACKAGING, TRANSPORTATION & STORAGE

According to the different physico-chemical properties there are differences in transportation, storage and delivery of peracetic acid solutions.

Concentration of PAA	PAA < 35%	PAA 35%	PAA 40%
Canister	30kg	30kg	30kg
Drum	220kg	220kg	
IBC	1100kg	1000kg	
Bulk	yes	yes	no

For the exact product classification as well as labeling please refer to the corresponding material safety data sheet. PeraShock® products must be stored in an upright position and in their original containers. They have to be stored in a cool place, protected from direct sun light and with good ventilation. Any contamination, especially with metal ions, alkalis and reducing agents must be avoided. PeraShock® products must be kept away from any heat source and combustible materials, especially organic solvents. Vapors of highly concentrated peracetic acid may form explosive mixtures with air. Packages are equipped with venting devices to avoid overpressure. Do not cover the closures which allow venting. All containers should be checked regularly. When properly transported and stored in the originally sealed containers, all peracetic acid products show no notable loss of content for at least 12 months. The shelf life of plastic containers with high-strength peracetic acid is limited to 24 months. Applicable storage regulations for each country must be followed.

SAFETY & HANDLING

PeraShock® products have oxidizing and corrosive properties. Safety precautions have to be applied accordingly. While working with PeraShock® solutions, proper care must always be taken. Safety goggles, protective gloves and suitable protective clothing must be worn. If necessary, a gas mask should be used with an appropriate filter. If peracetic acid comes into contact with skin and eyes, it must be rinsed off thoroughly with plenty of water and the person must seek medical attention. If the product is spilled during processing, it must be absorbed with inert material or diluted immediately with a large amount of water and washed away. In case of fire use water or foam. Clean equipment made from compatible materials such as polyethylene, glass or stainless steel must only be used. Products must not be confined in containers, vessels, piping systems or between valves. There must always be a pressure release or breathing device. Once the product has been drawn from the original container it should never be returned due to a risk of contamination and decomposition. If our PeraShock® solutions are used as biocides always read labels, material safety data sheets (MSDS) and product information before use. Use biocides safely.

APPLICATION TABLE/ EPA LIST

Category	Category Description	Categorization Type
Agricultural	Relating to agricultural, including the raising and farming of animals and growing of crops	CPCat Cassette
Agricultural, animal	Related to animals (but non-veterinary) e.g., animal husbandry, farming of animals/animal production, raising of animals for food or fur, animal feed, products for household pets	CPCat Cassette
Agricultural, animal, cattle, dairy	Related to dairy cattle, the operation of dairy facilities, or manufacture of dairy products	CPCat Cassette
Agricultural, crop	Products used on crops, or related to the growing of crops	CPCat Cassette
Air_treatment	Air cleaners and anti-odor agents, air purifiers, air conditioners, air filters, general air care products	CPCat Cassette
Antimicrobial	Type of pesticide used to destroy or inhibit the growth of disease-causing mechanisms, can be impregnated into clothing	CPCat Cassette
Bleaching	General bleaching agents, bleaching agents for textiles (unclear if bleaching agents are for consumer or industrial use)	CPCat Cassette
Cleaning_washing	Related to all forms of cleaning/washing, including cleaning products used in the home, laundry detergents,	CPCat Cassette

	soaps, de-greasers, spot removers, etc; modifiers included when specific information is known, such as dry cleaning, laundry, soap, window/floor, etc	
Cleaning, washing, dishwashing	Related to dishwashing products (soaps, rinsing agents, softeners, etc)	CPCat Cassette
Cleaning, washing, disinfectant	General disinfectants/sanitizing agents, disinfectants related to drugs (modified by 'drug'), and disinfectants used in drinking water, or animal feed (modified by 'drinking water' and 'feed')	CPCat Cassette
Cleaning, washing, laundry	Laundry products (such as cleaning/washing agents), or laundry facilities	CPCat Cassette
Colorant	Term used for colorants, dyes, or pigments; includes colorants for drugs, textiles, personal care products (cosmetics, tatoo inks, hair dye), food colorants, and inks for printing; modifiers included when application is known	CPCat Cassette
Consumer use	Term applied when the only information the source indicates is 'consumer' or 'consumer product ; also applied to terms that the source indicates are for consumer use, yet the descriptor term is ambivalent about usage (e.g., cleaning washing products may be for industrial or consumer use, when the source indicates consumer use, the consumer use term is also applied) - see appendix for full list of unambiguous consumer related terms plus ambiguous consumer related terms which	CPCat Cassette

	if indicated are labeled with 'consumer use'	
Disinfectant	General disinfectants/sanitizing agents, disinfectants related to drugs (modified by 'drug'), and disinfectants used in drinking water, or animal feed (modified by 'drinking water' and 'feed')	CPCat Cassette
Drug	Drug product, or related to the manufacturing of drugs; modified by veterinary, animal, or pet if indicated by source	CPCat Cassette
Drug, veterinary, biocide	Chemical which can deter, destroy, or control a harmful organism by chemical or biological means (type of pesticide)	CPCat Cassette
Facility, food production	Related to food production (restaurants, catering, etc)	CPCat Cassette
Facility, manufacturing, food, dairy	Related to dairy cattle, the operation of dairy facilities, or manufacture of dairy products	CPCat Cassette
Feed, animal	Related to animals (but non-veterinary) e.g., animal husbandry, farming of animals/animal production, raising of animals for food or fur, animal feed, products for household pets	CPCat Cassette
Feed, animal, disinfectant	General disinfectants/sanitizing agnets, disinfectants related to drugs (modified by 'drug'), and disinfectants used in drinking water, or animal feed (modified by 'drinking_water' and 'feed')	CPCat Cassette
Fluid property modulator	Includes antifoaming agents, coagulating agents, dispersion agents, emulsifiers, flotation agents, foaming agents, viscosity adjustors, etc	CPCat Cassette
Food	Food for human consumption, does not include food additives (see food additive); also includes manufacture of	CPCat Cassette

	food, facilities related to food (with appropriate modifiers)	
Food additive	Includes spices, extracts, colorings, flavors, etc added to food for human consumption	CPCat Cassette
Food additive, flavor	General flavoring agents used in foods, including condiments and seasonings	CPCat Cassette
Food contact	Includes food packaging, paper plates, cutlery, small appliances such as roasters, etc.; does not include facilities that manufacture food	CPCat Cassette
Fragrance	Fragrances or odor agents, can be used in home products (cleaners, laundry products, air fresheners) or similar industrial products; usage indicated when known; more specific modifiers included when known	CPCat Cassette
Hunting	Related to the activity of hunting	CPCat Cassette
Industrial_manufacturing		CPCat Cassette
Inert		CPCat Cassette
Manufacturing	If applied entry is related to the manufacturing process for the product, widely applied, modifiers often included (if not included, no additional information is known)	CPCat Cassette
Manufacturing, beverage	Beverages for human consumption (e.g., juice, water, alcohol), or related to beverages for human consumption (e.g. machinery for production of beverages, or facilities serving beverages)	CPCat Cassette
Manufacturing, beverage, alcohol, beer	Alcoholic beverage for human consumption	CPCat Cassette
Manufacturing, chemical	General term used only when the only information known from the source is 'chemical,' typically related to	CPCat Cassette

	manufacturing of chemicals, or laboratory chemicals	
Manufacturing, drug	Drug product, or related to the manufacturing of drugs; modified by veterinary, animal, or pet if indicated by source	CPCat Cassette
Manufacturing, export	Related to manufacturing for export (additional information unknown)	CPCat Cassette
Manufacturing, food	Food for human consumption, does not include food additives (see food additive); also includes manufacture of food, facilities related to food (with appropriate modifiers)	CPCat Cassette
Manufacturing, food, cheese	Food for human consumption	CPCat Cassette
Manufacturing, food, dairy	Related to dairy cattle, the operation of dairy facilities, or manufacture of dairy products	CPCat Cassette
Manufacturing, food, meat	Related to the farming of meats (including cattle, poultry, swine), and the manufacturing of meat for human consumption	CPCat Cassette
Manufacturing, machines	Manufacturing of or related to machinery, for production of cement or food, air/spacescraft machinery, electrical machinery, etc	CPCat Cassette
Manufacturing, machines, medical	General medical instruments or medical facilities, spectacle lenses and optical instruments	CPCat Cassette
Manufacturing, paper	Related to the manufcturing of pulp or paper products, or paper products in general	CPCat Cassette
Manufacturing, raw material	Raw materials used in a variety of products and industries (e.g. in cosmetics, chemical manufacturing, production of metals, etc); modifiers included when known to indicate what the raw materials are used for	CPCat Cassette
Manufacturing, soap	Soaps, includes personal care products for cleansing the	CPCat Cassette

	hands or body, and soaps/detergents for cleaning products, homes, etc	
Manufacturing, textile	Textiles used for clothing or furniture upholstery, processes related to textiles (e.g. softeners, antiwrinkle agents), or the processing/manufacturing of textiles	CPCat Cassette
Mining	Related to the mining industry, mining for coal, metals, etc	CPCat Cassette
Pesticide	Substances used for preventing, destroying or mitigating pests	CPCat Cassette
Pesticide, active ingredient	Active ingredients in a product (often active ingredients in pesticide, if so also tagged with 'pesticide')	CPCat Cassette
Pesticide, antimicrobial	Type of pesticide used to destroy or inhibit the growth of disease-causing mechanisms, can be impregnated into clothing	CPCat Cassette
Pesticide, antimicrobial, active ingredient	Active ingredients in a product (often active ingredients in pesticide, if so also tagged with 'pesticide')	CPCat Cassette
Pesticide, biocide, active ingredient	Active ingredients in a product (often active ingredients in pesticide, if so also tagged with 'pesticide')	CPCat Cassette
Pesticide, biocide, non-agricultural	Pesticide for non-agricultural use	CPCat Cassette
Pesticide, food additive	Includes spices, extracts, colorings, flavors, etc added to food for human consumption	CPCat Cassette
Pesticide, food contact, antimicrobial	Type of pesticide used to destroy or inhibit the growth of disease-causing mechanisms, can be impregnated into clothing	CPCat Cassette
Pesticide, inert ingredient	Inert ingredients in a pesticide	CPCat Cassette

Pesticide, preservatives	Includes preservatives used in cosmetics, film, wood preserving agents, foods, etc (note food preservatives are also indicated as food additive)	CPCat Cassette
Process regulator	Accelerators, activators, oxidation agents, reducing agents, etc	CPCat Cassette
Process regulator, antioxidant	General antioxidants, application indicated if known	CPCat Cassette
Process regulator, oxidant	Oxidizing/reducing agents, unknown application	CPCat Cassette
Sewage treatment	Relating to the disposal and/or treatment of sewage	CPCat Cassette
Surface treatment	Surface treatments for metals, hardening agents, corrosion inhibitors, polishing agents, rust inhibitors, water repellants, etc (surfaces to be applied to often not indicated in source description)	CPCat Cassette
Water treatment	Includes water softeners, lime removers, and the products used in the process of the collection, purification, and distribution of water	CPCat Cassette

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