frequently asked question

how does an antibiotic resistant strain affect disinfectants?

Antibiotic resistant strains do not mean chemical resistance. These bacteria have developed resistance to antibiotics pertaining to human clinical situations. This does not imply that these strains are resistant to chemical disinfection. Chemical are now tested against antibiotic resistant strains such as VRE, MRSA etc. These are shown on the label claims.

There are differing opinions within the scientific community as whether over use of disinfectants can lead to chemical resistance. A literature search showed that there are several published studies that suggest disinfectant chemistries such as quats that leave an active residual on the surface can lead to resistance.

some products leave a residual active ingredient on surfaces. The manufacturers claim that this residual is important for continued biocidal activity.

Residual active ingredients left by antimicrobials only are effective while wet. In addition these residuals may contribute to chemical resistant strains of microorganisms.

why is it important for disinfectants to be free of VOCs?

Volatile Organic Compounds (VOCs) are compounds containing at least one carbon atom, excluding carbon monoxide and carbon dioxide, which evaporate readily to the atmosphere. VOCs include a wide range of individual substances from many substance classes such as hydrocarbons, halocarbons and oxygenates.

Major VOC emission sources are the organic solvents used in many consumer and commercial products such as underarm anti-perspirants, cleaning and disinfectant products, exterior paints used on homes, and commercial printing inks; transportation sector activities such as the exhaust emissions from cars and trucks; various industrial processes such as chemical manufacturing; and residential/commercial/fuel/wood combustion. Not all VOCs originate from man made sources, however, in more populated and industrial areas man made emissions predominate.

VOC solvent use is the second largest source of man made VOC emissions to the atmosphere in most areas of Europe.

what is the difference between BHP and the H2O2 that can be purchased at a drug store?

Hydrogen peroxide purchased at a Drug Store is a 7% solution mixed with water. Scientists had worked for many years to find a way to properly mix other ingredients in this water and hydrogen peroxide solution and create a commercially viable and effective product.

BHP is a formulation of hydrogen peroxide, surfactants and other inert ingredients which results in less active ingredient but better cleaning and faster germicidal performance than hydrogen peroxide at 7% with water (at the in-use dilution of BHP for environmental surfaces the active ingredient is <2%).

many cleaning and/or disinfectant products on the market have pleasant smells such as citrus, lime etc. Why doesn't BHP have a scent?

A reason for creating a scent-free product is to avoid the masking of odours. In most cases, the smell of a cleaner and disinfectant has the effect of masking the odour of the chemical and ultimately the odour in the room or facility. Clean really has no smell. It is the absence of smell due to the absence of any odour causing materials. When you clean and disinfect with BHP there isn't a scent to mask the cleanliness. Your room or facility will eventually just smell clean.

Addition of scents which very often contain Volatile Organic Compounds (VOC's) to cleaning and disinfectants is also one of the leading causes of fragrance sensitivity and negative affects to indoor air quality. By creating a product that is scent free there are fewer negative reactions by end users, fewer complaints by occupants of the facility using BHP and therefore, from a occupational health & safety standpoint a better product to use.

saniswiss

122011E

ADF innovation award winner 2008

reddot design award winner 2008

saniswiss sa • chemin des tulipiers 19 • 1208 Genève • Switzerland • t +41 22 718 75 75 • f +41 22 718 75 76 • info@saniswiss.com • www.saniswiss.com

frequently asked question

how do VOCs affect the environment ?

When VOCs are released to the atmosphere, they can participate in atmospheric photochemical reactions to form ground-level ozone and particulate matter. These two air pollutants are the main ingredients of smog and cause serious health effects for Canadians, including thousands of premature deaths, hospital admissions and emergency room visits every year.
Almost all ground-level ozone and in the order of two-thirds of particulate matter are formed in the atmosphere through the reactions of precursor substances, with VOCs being one of the most significant. Consequently, reduction of atmospheric levels of particulate matter and ozone must be accomplished through reductions of precursors, such as VOCs.

are VOCs harmful to human health ?

Health impacts can occur when VOCs are released to the atmosphere and participate in atmospheric photochemical reactions leading to the formation of ground level ozone and particulate matter. These two air pollutants are the main ingredients of smog and cause serious health effects for Europeans, including thousands of premature deaths, hospital admissions and emergency room visits every year. VOCs are one of the primary precursor substances leading to the atmospheric formation of both of ground level ozone and particulate matter.
The scope of substances that may be characterized as VOCs is extremely broad. Actions under the European commission agenda are targeted at the sub-set of these substances used as solvent constituents in consumer and commercial products. The Agenda actions are not in response to a determination that these VOC solvent constituents pose any direct risk to human health, but rather the fact that upon evaporation to the atmosphere, they can undergo photochemical reaction resulting in the formation of ground-level ozone and particulate matter.

why cross-resistance between certain “classical-chemical disinfectants“ and antibiotics ?

Most of today’s disinfectants and biocides contain chemicals that have a certain effect on microbes and their replication by way of a biocidal “mechanism of action”. In some cases, consequent exposure to biocides with a certain mechanism of action causes the bacteria to better tolerate biocides with this same mechanism of action. This is what is called “antimicrobial resistance” to biocides. The microbe develops resistance to certain antimicrobial active ingredients, or more accurate: its mechanism of action. This antimicrobial resistance can be caused by the use of biocides (“non-invasive antimicrobials”) and can be caused by antibiotics (“human antimicrobials”, or “medicinal antimicrobials”).

since when effect of biocides on resistance to antibiotics have been registered ?

It is only recently evidenced that resistance caused by (sub-inhibitory concentrations of) biocides can create a resistance also against antibiotics. This development is alarming and has a direct effect on human health and infection prevention.

saniswiss

122011E

ADF innovation award winner 2008

reddot design award winner 2008

saniswiss sa • chemin des tulipiers 19 • 1208 Genève • Switzerland • t +41 22 718 75 75 • f +41 22 718 75 76 • info@saniswiss.com • www.saniswiss.com

frequently asked question

Does "classical-chemical" disinfectant containing quaternary ammonium compounds, cause resistance to antibiotics?

The most widely used group of chemicals is the so-called quaternary ammonium compounds, also called Quats or QACs. It is long known that Quats can cause antimicrobial resistance. We have enclosed some relevant research that proves this effect. The effect causes the development of resistant organisms. By itself this is a very alarming finding and should have serious consequences for the use of Quats in infection control and infection prevention, especially in situations where weak individuals are present (hospitals, operating rooms, emergency departments, ambulances, elderly care, long-term care, schools, and child-care).

However, recent research has shown that Quats do not only cause resistance to disinfectants or biocides, but also to antibiotics. This poses another risk and is of even greater importance for Infection Prevention practitioners. The recent publication of the article in the renowned international scientific journal Microbiology named "Effect of sub inhibitory concentrations of benzalkonium chloride on the competitiveness of Pseudomonas aeruginosa grown in continuous culture" (Paul H. Mc Cay etal, 2010), provided overwhelming and alarming evidence. The researchers found that exposure to benzalkonium Chloride (BCK, a Quat) have a direct effect on the resistance of Pseudomonas aeruginosa. In under 30 generations (this means less than 1 month) the Minimum Inhibitory Concentration (MIC, the lowest concentration of an antimicrobial that will inhibit the visible growth of a microorganism after overnight incubation) increased by a factor of 12 (1200%) from 25 mg/l to over 300 mg/l and the MIC of a number of antibiotics increased substantially (256 times) during this same period.

What is the new problem with hospital acquired infections?

Data from the National Health Services (NHS) in the UK :

- There were 36,097 Clostridium difficile infections reported in England in 2008/09 (patients aged two years and over).
- Saniswiss offers effective and fast working disinfection alternatives that are user and environmentally friendly, making use of highly advanced technologies and based on extensive scientific research and evidence.
- Saniswiss's formulas capitalize on the friendliness of hydrogen peroxide, which natural disinfection power is boosted by our patented technologies, in order to obtain the necessary efficacy at low concentrations already.
- This unique combination of friendliness and effectiveness enables the use of our products in new and existing applications, without the hazards of traditional chemicals. With Saniswiss, it can be done.
- Figures on MRSA bloodstream infections showed there were 2,933 cases reported in England in 2008/09
- From January to March 2009 there were 262 norovirus outbreaks reported from 43 NHS trusts. A total of 82% of outbreaks resulted in some form of ward closure, with 2,814 patients and 747 staff reported to have been affected as part of these outbreaks, and over 4,000 bed-days were lost.

  The resistance to antibiotics is an important driver for the costs associated with hospital acquired infections because they are difficult or impossible to treat with antibiotics. The cost of hospital acquired infections runs into billions of euros per year in Europe only. This equals to tens of thousand of bed-days lost. Examples of resistant strains are MRSA, VRE, MR-TBC and the recently found ESBL-producing strains (Netherlands), mainly escherichia coli and klebsiella pneumoniae. In certain countries, such as Germany, norovirus and Clostridium difficile are important causes of outbreaks. When biocides do contribute to the resistance of microbes against antibiotics, as is evidenced by recent research, an immediate transition to biocides with a mechanism of action that is substantially different to common antibiotics, or to biocides that have an oxidative mechanism of action, is recommended.

saniswiss

122011E

ADF innovation award winner 2008

reddot design award winner 2008

saniswiss sa • chemin des tulipiers 19 • 1208 Genève • Switzerland • t +41 22 718 75 75 • f +41 22 718 75 76 • info@saniswiss.com • www.saniswiss.com

frequently asked question

Regarding the so-called "residual effect" as promotional effect for quats?

Quats are leaving a so-called sub-inhibitory concentration residue on surfaces. Some companies actively promote the Quats as having a 24 hour, 48 hour, or 7 days "residual effect". This long-lasting residual effect is a dangerous side-effect that causes antimicrobial resistance and may even cause resistance of organisms to antibiotics.

Does "classical-chemical" disinfectant containing chlorhexidine cause cross-resistance to Antibiotics?

Not only quats cause a proven negative cross-resistance between biocides and antibiotics. In other research (see enclosed) it is proven that cross-resistance exists between chlorhexidine (CHX) and several antibiotics such as beta-lactams, quinolones and aminoglycosides. Combined resistance of antibiotics and biocides can be presumed by a similar kind of action of both types of agents. CHX and quaternary ammonium compounds act through the damage of the outer cell layers and cross the cell wall or outer membrane, then attacks the bacterial cytoplastic or inner membrane causing leakage of intracellular constituents. Changes in outer or inner membranes, but also efflux pumps have been implicated in bacterial resistance to biocides and antibiotics. Quats also have a presumed effect on transport mechanisms and replication mechanisms of microbes.

What about quaternary ammonium compounds and chlorhexidine in Practice?

Quats and Chlorhexidine are promoted because of their activity in low concentrations, resulting with Quats in a high dilution rate and their residual effect. It is clear from the research data presented here that the high dilution rates (resulting in very low active concentrations) and the residual effect are a dangerous combination for substances like quats and Chlorhexidine. Quats are often used on hard surfaces and floors and remain present for many days or even weeks, with the sub-inhibitory concentrations present. CHX is used frequently in hand washes and hand antiseptics. CHX is present on the skin for many hours and is actually contributing to microbial resistance, including resistance to antibiotics.

Does Saniswiss use oxidative ingredient in its BHP-thechology?

Oxidative active ingredients, such as chlorine, iodine, ozone, peracetic acid or hydrogen peroxide do not cause this cross-resistance effect and are advised to be used in all applications where vulnerable individuals are present.

However, iodine has a substantial (negative) colouring effect, which makes it only relevant for certain skin applications; ozone is a gas and therefore highly unpractical, and chlorine is corrosive and has environmental and user safety negatives. Hydrogen peroxide and peracetic acid are corrosive in higher concentrations. Peracetic acid has a very specific and unpleasant smell and is dangerous and irritating for the respiratory system. Furthermore both peracetic acid and chlorine are corrosive to skin and eyes.

What is best to choose to prevent risk of antibiotic cross-resistance of microorganisms?

Saniswiss present independent data in which it is proven that exposure of micro-organisms to quats and chlorhexidine causes resistance of micro-organisms to several commonly used antibiotics. It is recommended to transfer in critical environments to biocides with different mechanisms of action or oxidative biocides to avoid this resistance build-up. The use of quats and chlorhexidine actually increases the risk of antibiotic resistance of microorganisms. This is counterproductive for infection prevention and infection control and should have consequences for the (abundant) use of "classical-chemical" disinfectant containing quats and chlorhexidine where no sterilization can be secure after use of antimicrobials.

Saniswiss-biosanitizer is the solution to solve all these cross-resistance issue thanks to the low level of hydrogen peroxide and its oxidative mode of action.

saniswiss

ADF innovation award winner 2008

reddot design award winner 2008

122011E

saniswiss sa • chemin des tulipiers 19 • 1208 Genève • Switzerland • t +41 22 718 75 75 • f +41 22 718 75 76 • info@saniswiss.com • www.saniswiss.com