



Abena Antimicrobial Glove

Revolutionizing the world of infection prevention



✓
The worlds first
non-leaching
antimicrobial
nitrile glove

✓
Provides
active
protection
against HAIs

✓
Kills up to
99.999%
of selected
bacteria



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Benefits of Abena Antimicrobial Gloves

- ✓ World's 1st non-leaching antimicrobial gloves
- ✓ Kills up to 99.999% of selected bacteria
- ✓ Provides active protection against HAIs
- ✓ Tested non-sensitising on skin



A gamechanger for Healthcare associated infections

Every year, Healthcare associated infections cause unnecessary suffering and increasing medical costs for millions of patients and their families around the world. These infections prolong hospital stays, increase the risk

of post-operative complications and disabilities, increase resistance to antibiotics, and even result in unnecessary deaths and massive financial losses to the healthcare system.

EU
 Affected Patients
4.1 million
 Deaths
37.000
 Cost approx.
7 billion EUR

USA
 Affected Patients
1.7 million
 Deaths
99.000
 Cost approx.
6.5 billion USD

Annual impact of HAI in the USA and Europe

Source : Adapted from World Health Organization, Healthcare-Associated Infections Fact Sheet.

Introducing a new approach to Healthcare

Our needs as individuals and health-care providers are changing every day. We live longer. We face challenges of multiresistant bacteria and a growing population over the age of 80. It is more important than ever that we keep our focus on tomorrow's essential health-care needs.

Abena Antimicrobial Gloves

As the first glove in the world to offer high levels of antimicrobial protection while being non-leaching, Abena Antimicrobial Gloves are a gamechanger for the world of infection prevention.

Abena Antimicrobial Gloves are a new type of medical examination glove with built-in antimicrobial technology to fight infection and combat antimicrobial resistance.

Activated by light and oxygen, and able to kill up to 99.999% of microbes, Abena Antimicrobial Gloves provide an extra active layer of protection to health-care around the world.



Key features



Effective against a wide range of microbes



Photo-dynamic quick kill



Non-leach technology



Allround glove applications



No impact on bacterial resistance



Proven skin-safe

An active approach in preventing HAIs

Abena Antimicrobial Gloves play an active role in reducing the spread of infections

While conventional medical gloves serve only as a passive barrier between microbes and your hands, Abena Antimicrobial Gloves actively reduce the risk of infection transmission from an infection source to a susceptible patient.

What are Healthcare Associated Infections?

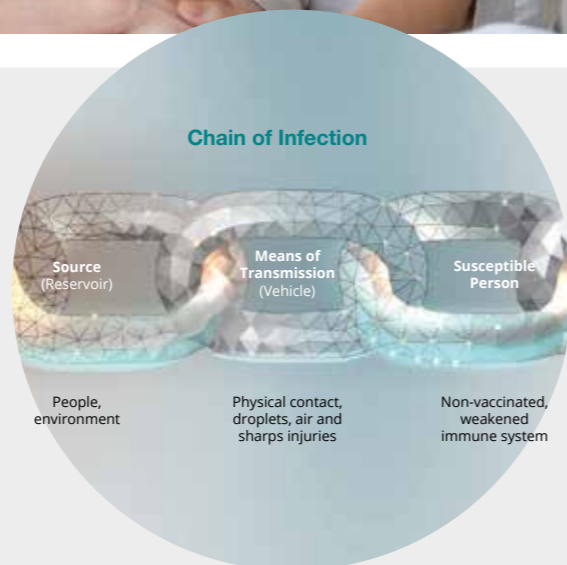
Healthcare-associated infections include infections developed as a result of medical care in a hospital or health-

care facility, which was neither present nor incubating at the time of admission. It includes infections acquired by patients in the medical facility as well as occupational infections among staff.



About Healthcare Associated Infections

- Clinical studies show that medical gloves play a key role in preventing contamination, dissemination and transmission of pathogens in healthcare settings, which is why The World Health Organization (WHO) recommends wearing medical gloves.
- Enterococcus faecalis (VRE) is responsible for 80% of human infections.
- Infections occur when microbes enter the body, breed and cause a reaction to the body. Three things lead to an infection: a source, a susceptible person, and the transmission (vehicle).



Kills microorganisms quickly upon contact

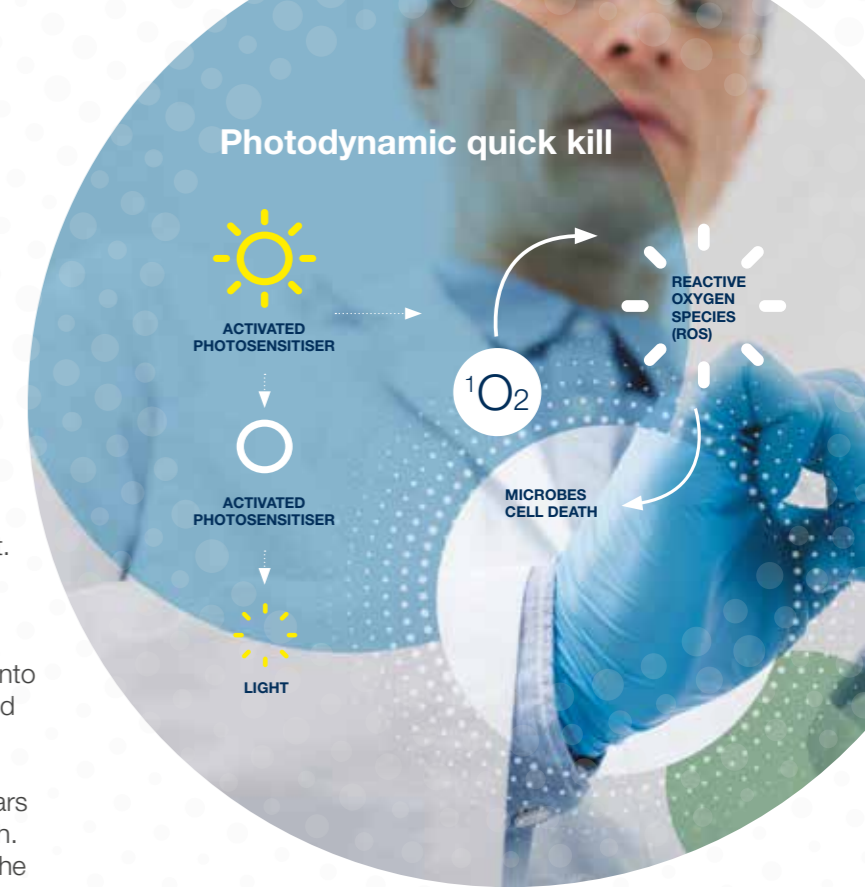
The active ingredient on the glove is a photosensitizer which generates singlet oxygen when exposed to light. This singlet oxygen oxidizes the bacteria's protein and lipid, thus leading to the death of microbes.

Independent testing has shown that bacteria coming into contact will be exposed to the antimicrobial activity and will be killed within just five minutes of contact.

This technological breakthrough is based on many years of thorough and groundbreaking antimicrobial research. Ultimately, Abena's Antimicrobial Gloves help reduce the risk of transmission from an infection source to a susceptible patient. This technology, built into gloves, which are already standard practice in many medical and healthcare settings, also removes the need for additional solutions and chemicals.

No impact on bacterial resistance

The potential for development of bacterial resistance to the active has been assessed as 'low'. This is attributed to the nonspecific nature of the glove's bacteria-killing mechanism. Generally, oxidative antimicrobials such as the AMG technology is viewed as having low probability for development of resistance by the EU Scientific committee.



Abena Antimicrobial Gloves
kill 99.999% of selected microbes*

Bactericidal Efficacy of Abena Antimicrobial Gloves*

MRSA 99.988% in 5 minutes	→		←	Enterococcus faecalis (VRE) 99.982% in 5 minutes
Staphylococcus aureus 99.999% in 5 minutes	→		←	Streptococcus pyogenes 99.946% in 5 minutes
Enterococcus faecium 99.991% in 5 minutes	→		←	Klebsiella pneumoniae 96.471% in 10 minutes
			←	E-Coli 99.030% in 15 minutes

*Based on ASTM D7907 Standard Test Methods for Determination of Bactericidal Efficacy on the Surface of Medical Examination Gloves, AMG is effective in killing prevalent and antibiotic resistant microbes such as MRSA and VRE. Test data has shown that AMG can kill 99.999% of some microbes in as quickly as 5 minutes. Test result available upon request.

Features

Groundbreaking Non-leach Technology

Abena Antimicrobial Gloves are the world's first non-leaching antimicrobial gloves. The active has been tested for non-migration with the following medium:

- Water
- Hot water (45 degrees celcius)
- Sweat
- Saliva
- Ethanol

All-round Glove Applications

Abena's Antimicrobial Gloves have been proven safe for use for different applications and industries.

Medical

Tested for impermeability and glove strength, AMG glove is effective in preventing contamination between patient and healthcare practitioner, as well as for handling various chemotherapy drugs. All tests conducted are in accordance to recognized international standards such as ASTM D6319, EN 455 and ISO 11193 part 1.

PPE (Personal Protective Equipment)

The glove is tested to protect users from substances and mixtures that are hazardous to health, and harmful biological agents that may cause very serious consequences or damage to health. Tests conducted are in accordance to the harmonized standards which complies with PPE Regulation.

Proven Skin-safe

Abena Antimicrobial Gloves have been tested safe for use against various contacts. These tests confirm that the AMG glove is:

- Non-irritating: does not cause primary skin irritation like redness (erythema) or slight swelling (edema).
- Non-sensitizing: does not contain any substance that will induce skin allergy.
- Non-toxic: No toxic effects occurring following oral administration.
- Non-cytotoxic: does not display destructive action on cells.
- Non-sensitizer & low dermatitis potential: Modified Draize Test shows no allergic reaction in normal tissue after exposure

FAQ

Do antimicrobial gloves replace the need for hand hygiene?

Although the glove has been found effective against a wide range of microbes, it does not replace the need for hand hygiene. AMG serves as an extra precaution or tool to help mitigate the spread of HAI. Protocols for hand rubbing or hand washing should still be performed before donning and after removing gloves.

What does non-leaching mean? Is it safe?

The antimicrobial gloves are designed to be non-leaching in order to ensure the active ingredient does not transfer to the patient. To further ensure the safety of the active ingredient, the gloves have been tested for biocompatibility. ISO 10993 biocompatibility testing conducted on the inside and external surface of the gloves have confirmed that the gloves are non-sensitizing, non-irritating, non-toxic (oral) and non-cytotoxic.

The Modified Draize-95 test was also conducted where both the inner and outer surfaces of the gloves were tested on human skin. The gloves provided no clinical evidence of inducing allergic reactions. Finally, tested at Intertek UK, the gloves were extracted using water, artificial saliva, artificial sweat and alcohol at room and body temperature. No active could be found extracted from the gloves' inner or outer surface.

How does singlet oxygen work?

In this technology a special dye is used. The dye absorbs visible light. The dye is thus raised from a ground state to an excited quantum state, in which an elevation in energy takes place. The energy then transfers to a proximal oxygen molecule found in the air, causing the oxygen molecule to also rise to an excited quantum state. The ground state of oxygen present in air, is a triplet electronic configuration. Upon sensitization by the dye molecule, the electronic configuration changes and enters the singlet state.

This singlet oxygen state is reactive and more oxidative compared to ground state oxygen and therefore, is able to kill microbes such as bacteria by oxidizing the cells' protein and lipid. Using the dye as a catalyst, singlet oxygen can be generated continuously as it absorbs light and air.

What are the advantages of using singlet oxygen antimicrobial systems?

Singlet oxygen is a non-selective system that can react rapidly against many microbial components. There is not one single protection mechanism that bacteria can protect itself from singlet oxygen. This is in contrast to antibiotics, which needs very specific mechanisms to treat a patient. As singlet oxygen is transient, it does not lead to the release of persistent biocides into the environment. As such, Abena Antimicrobial Gloves transforms the standard examination glove from a passive medical device to a medical device with active protection, which will actively reduce or inhibit microbial colonization.

What is the amount of light needed to activate the Antimicrobial Gloves?

Testing of AMG glove has been conducted at general lighting condition at hospitals of 1000 lux and 500 lux. Results show that there was no significant difference in bactericidal efficacy. Further testing at lower light levels are underway.

Would differences in lighting type affect the efficacy of Antimicrobial gloves (for example – LED, fluorescent, incandescent light bulb)?

No. The glove is activated by any white light source. It is specifically activated by light in the 600 - 700 nm region but all white light sources contain this, otherwise they would be colored.

Will the dye be depleted if the Antimicrobial Gloves are continually exposed to light?

No. As long as there is light and oxygen, the gloves are active. Heat-aged gloves (accelerated aging equivalent to 3 years shelf life) did not show significant difference in bactericidal efficacy compared to fresh gloves. The gloves were also exposed to "light" (equivalent to 30 days in an open box environment). Again, there was no significant difference in bactericidal efficacy compared to fresh gloves.

See how Abena Antimicrobial Gloves are revolutionizing the future of healthcare:

www.abena.com/antimicrobialgloves

