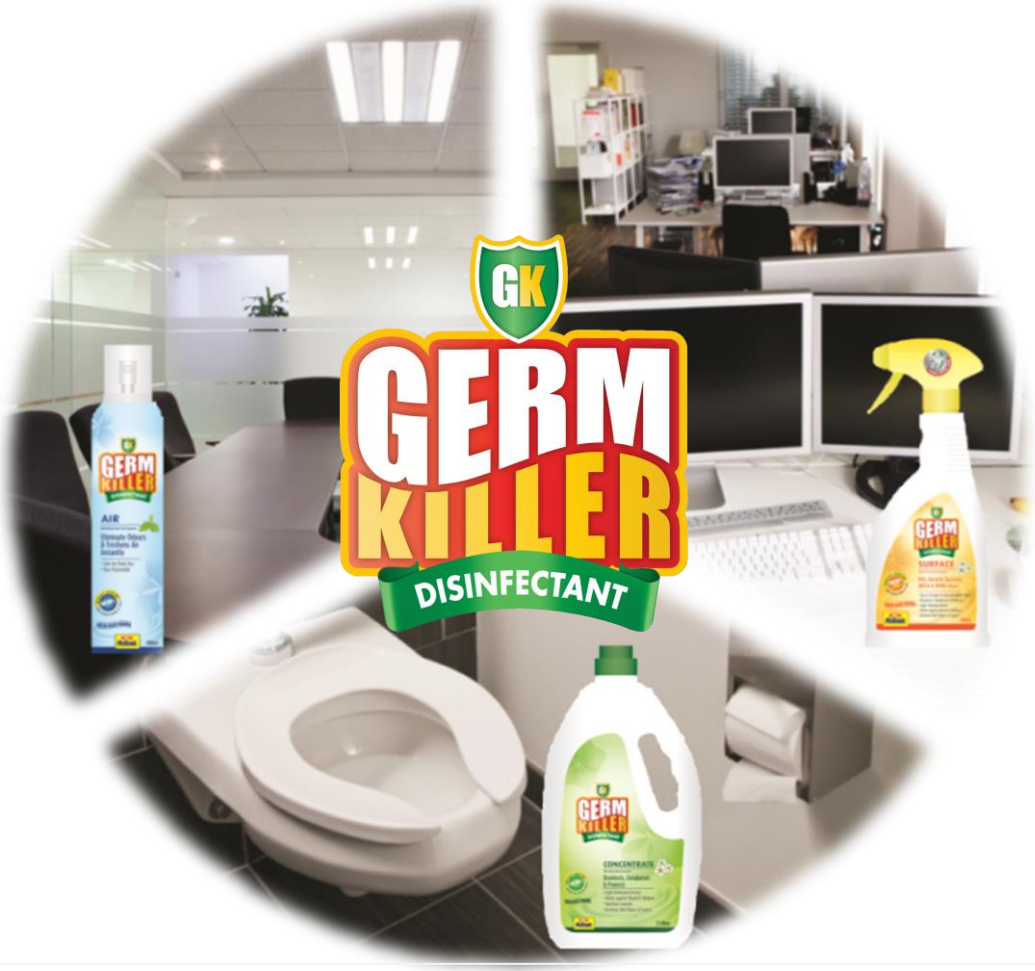


Protecting Your Personal Space

Executive Summary

- GK-Germkiller® disinfectants are the result of extensive research, development and testing with the sole focus on two objectives: **Effectiveness** and **Safety**
- Soap and detergent alone are insufficient for keeping a high human contact environment sanitary enough to reasonably limit the spread of communicable diseases. Disinfectant use is an important component of a cleaning regimen in hygiene-sensitive environments such as childcare centres
- GK-Germkiller® disinfectant formulations are based on Quats
  - Quats are compounds that have nearly 100 years of safe use and are well-studied and understood
  - Quats are permitted for use by the US Food and Drug Administration for food contact at defined concentrations
  - GK-Germkiller® quats are produced by a major Swiss Pharmaceutical and Lifescience company
  - GK-Germkiller® proprietary formulations are highly effective
  - GK-Germkiller® has had a long history of safe use around children
  - GK-Germkiller® is supported by US-based laboratory test reports and customers' references
- GK-Germkiller® products are **based on science** and we are committed to transparency and compliance to safety and regulations

Outline

- Choosing Quats as the active ingredient in GK-GermKiller®
  - What are Quats and what do they do?
  - Where and how are Quats-based disinfectants being used?
  - Why use Quats?
- Brief Overview of GK-Germkiller® products
- Online References

Choosing Quats in GK-GermKiller®

What are Quats and what they do?[16][17]

"Quats" is the nickname used for quaternary ammonium compounds. Their disinfectant properties have been recognized for nearly 100 years. These products range from disinfectants, sanitizers, and cleaners to wood preservatives, fabric softeners and personal care products.

As a group, Quats are highly-effective compounds for controlling a broad spectrum of microorganisms, including bacteria, moulds, yeasts, fungi, and some viruses. They are:

- used in **formulations for cleaning, sanitizing and disinfecting** hard, non-porous surfaces such as floors, walls, toilets and fixtures found in hospitals, schools, offices, and homes.
- **used in food-service environments** for disinfecting and sanitizing surfaces found in commercial kitchens and food processing plants. On the farm, they can be used on agricultural tools, vehicles, shoes, and milking equipment.
- used to **disinfect water-related equipment** in industrial processes, such as re-circulating cooling water systems and waste water systems. They are used, as well, in commercial swimming pools, spas, hot tubs, decorative ponds and fountains.
- used **in wood preservation** and as algaecide for use in farm ponds, landscape water features, and other aquatic environments where algae control is needed.

For more info, refer to

http://www.quats.org/wp-content/uploads/2012/03/Sheet-2-FINAL-Did-You-Know_-Facts-About-Quats.pdf

Choosing Quats in GK-GermKiller®

Where are Quats-based disinfectants used?[18]

- **At home**: On non-porous surfaces such as floors, counter tops, appliances, walls, toilet areas and fixtures.

- **In healthcare settings**: On hard non-porous surfaces in hospitals and other healthcare facilities, including nursing homes and medical research laboratories.

- **For commercial applications**: Registered for use in food handling/food storage establishments for use on the premises and on equipment, in flower shops, and for industrial premises and equipment. Other commercial sites include fast-food restaurants, funeral homes, athletic facilities, hotels, barber and beauty shops, convenience and grocery stores, offices, laundromats, correctional facilities, emergency vehicles and transportation terminals.

- **In schools**: On non-porous high-touch areas in schools and daycare centres, libraries, gymnasiums, locker rooms and other areas where children and others convene. Disinfection in schools after routine cleaning helps control outbreaks of communicable diseases.

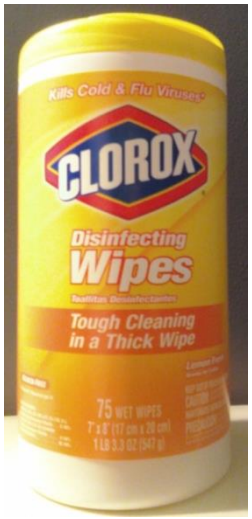
Choosing Quats in GK-GermKiller®

Where are Quats-based disinfectants used?[18]

- **On the farm**: Used in hatcheries, swine/poultry/turkey farms, dressing plants, farrowing barns, mushroom operations, citrus farms, and animal housing facilities.
- **As wood preservatives**: Help to remove and prevent mould and fungi that can cause wood deterioration over time.
- **For industrial processes and wastewater**: Added to recirculating water systems, cooling water, disposal water and oil field operations water to control the growth of microorganisms.
- **In recreational and landscaping water environments**: Used on surfaces around swimming pools, hot tubs, and in ponds and fountains to disinfect and control algae.

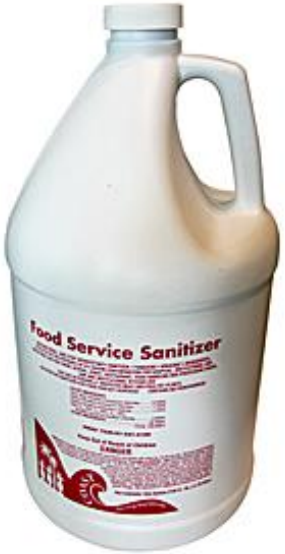
Choosing Quats in GK-GermKiller®

Where are Quats-based disinfectants used?[18]



Household Cleaners
http://thebiologyofleah.hubpages.com/hub/The-Science-Behind-Household-Cleaners

Contact lens cleaning solutions
https://pubs.acs.org/cen/whatstuff/86/8646wts.html



Food Service Sanitiser
http://www.coast-products.com/products/fss.html

Hair care products
http://mommagotstyle.com/2014/01/21/winter-skin-solutions-shut-out-the-dry/

Hospital Disinfectant
http://solutionsdesignedforhealthcare.com/solutions/products/disinfectants/virex%C2%AE-tb-rtu

Choosing Quats in GK-GermKiller®

Why use Quats?[19]

- Quats are one of the key classes of **disinfectants ingredients used worldwide** to help reduce the number of microorganisms on surfaces.

- Quats are excellent antimicrobial agents. By themselves, they are **odourless, non-staining and non-corrosive** to metals when used according to directions. They effectively kill bacteria, viruses, moulds and fungi on solid surfaces and in water. Commercial formulations are often used to kill germs that can cause disease in hospitals, restaurants, schools, and on the farm.

- The anti-microbial properties of Quats have **been recognised for nearly a century**.

- Quats **have a long history of safety and have been evaluated by the US Food and Drug Administration and is codified for food contact use under FDA regulations 21CFR178.1010** - PART 178 -- INDIRECT FOOD ADDITIVES: ADJUVANTS, PRODUCTION AIDS, AND SANITIZERS, Subpart B--Substances Utilized To Control the Growth of Microorganisms Sec. 178.1010 Sanitizing solutions

- Quat-based disinfectants are “one-step” products. They clean, disinfect and even protect at the same time.

Choosing Quats in GK-GermKiller®

Why use Quats?[19]

- More than 30 different Quat compounds have **been registered under U.S. EPA for use** in formulating cleaning, sanitising and disinfecting products
- Quat compounds are stable in liquid form, so they do not give off harmful/hazardous vapors
- Quats-based disinfectants are applied such that the surface is wetted and allowed to air dry after 10mins. Most formulation are **"non-rinse" products**.
- **At low 0.2% concentration, Quats can be applied as non-rinse sanitisers to food contact surfaces**[20]
- Quats are being used everywhere, including personal care products such as shampoo, cosmetics, contact lens cleaner, hand sanitisers, nasal sprays.
- The fact that Quats are used in **highly sensitive applications** such as contact lens cleaning underscores its effectiveness and safety in human-contact use!

GK-Germkiller® Disinfectants

Proudly Manufactured by Vance Chemicals in Singapore,

GK-Germkiller® carries a premium range of water-based disinfectants with broad spectrum bactericidal and virucidal properties, with specific products formulated safe for daily use in the presence of children;

- GK Air™ – To be used as an Air Disinfectant, Deodorizer and Freshener
- GK Surface™ – To be used as a Surface Disinfectant for all surfaces, including fabrics.
- GK Concentrate™ – To be diluted and used for soaking of toys and laundry
- GK Hand Sanitizer™ - To be used as alcohol-free sanitizer for germ-free hands.

More info on Quats can be found in Slide #7

GK-Germkiller® uses blends of Quats as its main active ingredient. Quats are highly effective, quick-acting germicidal agents that are non-toxic to humans or animals.

GK-Germkiller® products do not contain any known hazardous substances and can be used daily as a safe cleaner and protector for both environmental and personal use, even in the presence of children.

Copies of test reports and product safety data sheet (SDS) are attached separately.

GK-Germkiller® Disinfectants

QUATS that we use in our GK-GermKiller®;

- Are a proprietary blend of Quats produced exclusively by **Lonza**, one of the leading global life science and pharmaceutical companies based in Switzerland with market capitalization of over US$7billion.
- Lonza has the broadest portfolio in the industry that offers Quats for various applications globally.
- Most of Lonza Quats formulations have been registered under USA EPA* as microbial products against most common emerging pathogen[21]
- Lonza sites are routinely inspected by the FDA@ and other national health agencies to enable their products to be used by their customers in the United States, Europe, Japan, and many other regulated markets. [22]

GK-Germkiller® meets the requirements of *US EPA* Chemical Safety Regulation* in regards to Children's Health and does not contain any of the restricted substances that may pose risks to children's health.

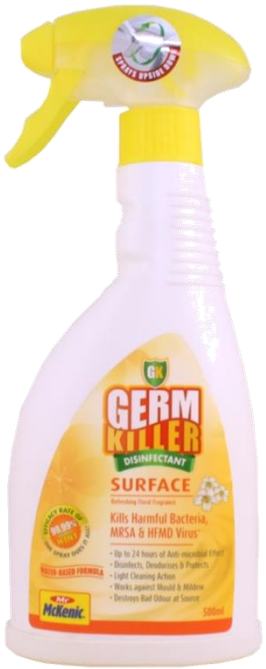
*The United States Environmental Protection Agency (US EPA) is an agency of U.S. federal government which was created for the purpose of protecting human health and the environment. Official website is http://www.epa.gov/

@ The Food and Drug Administration (FDA) is an agency within the U.S. Department of Health and Human Services, responsible for protecting public health through regulation of food safety, tobacco, medical prescriptions & more. www.fda.gov

GK-Germkiller® Disinfectants

GK-Germkiller® products are <u>fully certified and tested to be 99.9999% effective</u> against a broad spectrum of microorganisms such as gram–positive and gram–negative bacteria.

Our flagship product, GK Surface™ has been demonstrated effective against MRSA hospital superbug, and viruses such as H1N1 Influenza A flu virus, human coronavirus (stimulant of SARS & MERS) and coxsackie virus (that causes HFMD).



RESULTS

Product Name : GK Surface
Test Microorganism : *Staphylococcus aureus* (ATCC 6538)

Dilution / Contact Time	Initial Count of Test Microorganism per ml of Test Mixture		Count of Surviving Test Microorganism per ml		Log Reduction	Percentage Kill of Test Microorganism
	CFU per ml	Log_{10}	CFU per ml	Log_{10}		
Neat						
1 minute	64 000 000	7.81	Less than 10	Less than 1	More than 6.81	99.999984
5 minutes	64 000 000	7.81	Less than 10	Less than 1	More than 6.81	99.999984
30 minutes	64 000 000	7.81	Less than 10	Less than 1	More than 6.81	99.999984

Test Microorganism : *Pseudomonas aeruginosa* (ATCC 15442)

Dilution / Contact Time	Initial Count of Test Microorganism per ml of Test Mixture		Count of Surviving Test Microorganism per ml		Log Reduction	Percentage Kill of Test Microorganism
	CFU per ml	Log_{10}	CFU per ml	Log_{10}		
Neat						
1 minute	64 000 000	7.81	Less than 10	Less than 1	More than 6.81	99.999984
5 minutes	64 000 000	7.81	Less than 10	Less than 1	More than 6.81	99.999994
30 minutes	64 000 000	7.81	Less than 10	Less than 1	More than 6.81	99.999994

Percentage Kill of Test Microorganism
99.999984
99.999994
99.999994

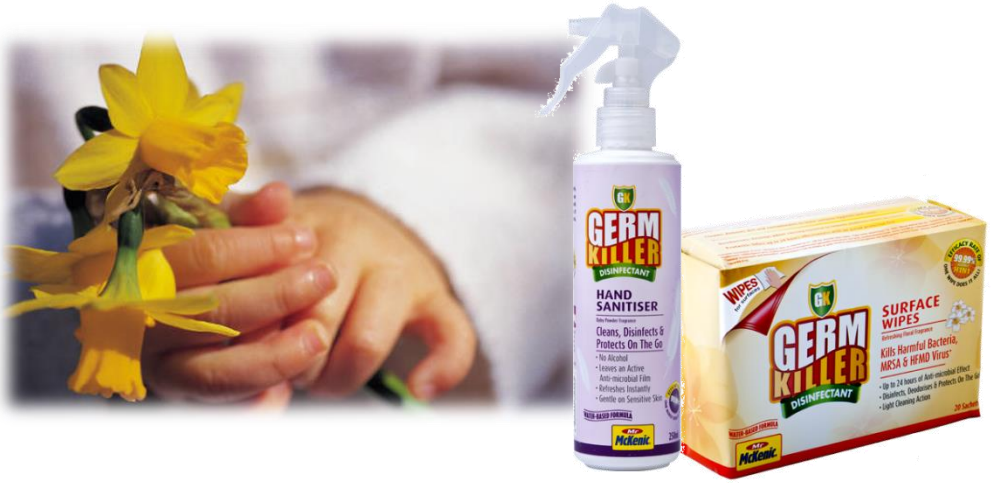
GK Surface™ is effective against:

- ✓ 99.9999% harmful bacteria
- ✓ MRSA
- ✓ HFMD
- ✓ H1N1
- ✓ Mers-coV

GK-Germkiller® Disinfectants

For products that may come in contact with skin,

GK Surface Wipes™ and **GK Hand Sanitiser™** are registered with Health Sciences Authority (HSA) under the Health Products Act.[23]



HSA Health Sciences Authority

HSA registered

- **GK Surface Wipes™**
- **GK Hand Sanitiser™**

GK-GermKiller® Range of Premium Water-based Disinfectants has been widely used in childcare sector, hospitality sector, including hotels, service apartments, medical care centres and leading airlines in Singapore.

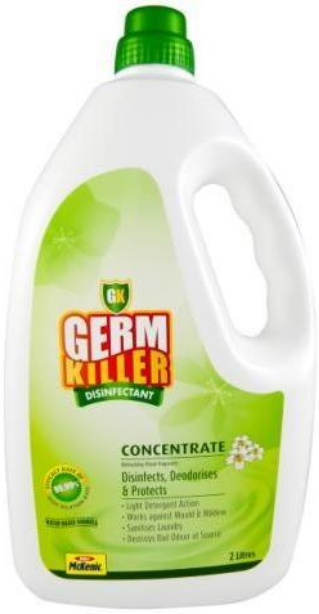
To know the unique features of each *GK-GermKiller®* product, pls see next slide or log onto www.gk-germkiller.com

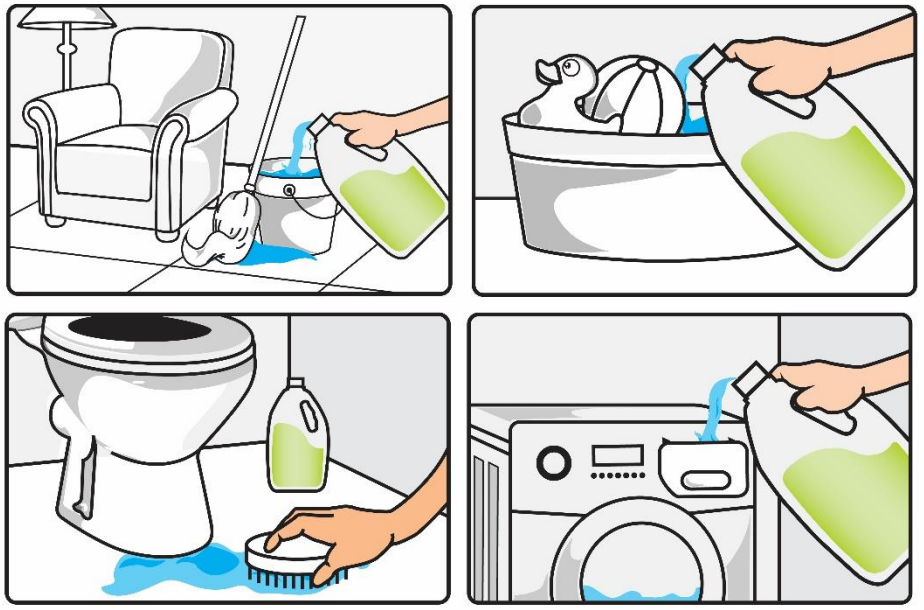
VANCE CHEMICALS

GK-Germkiller® Disinfectants

Cleans, Disinfects and Protects!

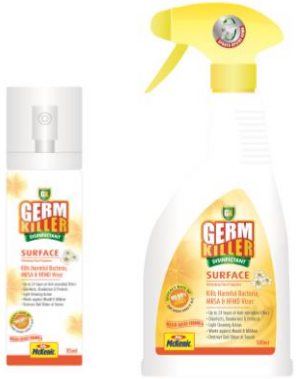
GK Concentrate™ is certified under **Singapore Green Label** and **complies with NSF** regulations for use in hygiene-sensitive and food-related industries.





With a high dilution rate of 1:80 and efficacy rate of 99.99999%, *GK Concentrate™* provides 24 hours anti-bacteria protection. Safe to use on all surfaces and even laundry! Value for money!

To know the unique features of each *GK-GermKiller®* product, please see next slide or log onto www.gk-germkiller.com



GK® Surface 85ml, 500ml

GK Surface™

- High Kill rate of 99.9999% bacteria
- Also effective against
  - ✓H1N1
  - ✓HFMD
  - ✓Mers-coV
  - ✓ Mould & Mildew

GK Air™

- High Kill rate of 99.9999% bacteria
- Freshens air
- Eliminate bad odour

GK® Air 300ml

GK

GERM KILLER

DISINFECTANT

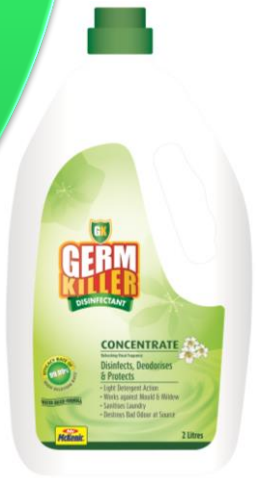
GK Hand Sanitiser™

- Kills 99.9999% bacteria
- Alcohol-Free

GK® Hand Sanitizer (WB), 250ml

GK Concentrate™

- Kills 99.99999% bacteria
- High concentration
- dilution rate of 1:80



GK® Concentrate 2L

Online references

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