

On the SURFACE

OPTIMUM INFECTION CONTROL PRACTICE

DISINFECTION TOOLS: Choose Carefully for Optimum Infection Control Practice

Research now shows that your choice of wiping materials can dramatically affect the amount of disinfecting agent that actually reaches surfaces being cleaned. KIMTECH PREP* Wipers for Disinfectants and Sanitizers, used in the WETTASK® Refillable Wet Wiping System, maintain an average of 88% or greater target concentration of quaternary amine actives during a prolonged period of use. The following study provides insight into how important your choice of cleaning materials can be to optimal disinfection.

According to the U.S. Centers for Disease Control and Prevention (CDC), cleaning and disinfecting environmental surfaces in healthcare facilities is critical to reducing the contribution of those surfaces to the incidence of healthcare-associated infections. In addition to proper hand hygiene, cleaning and disinfecting can help to minimize the transfer of microorganisms that can occur via hand contact between contaminated surfaces and patients.

CDC GUIDELINES

Environmental services, infection control and other healthcare professionals can look for guidance on environmental surface cleaning and disinfecting in the *Guidelines for Environmental Infection Control in Health Care Facilities*, which are recommendations of the CDC and the Healthcare Infection



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Control Practices Advisory Committee (HICPAC). The Guidelines note that continued compliance with environmental infection control measures [including environmental surface cleaning and disinfecting] will decrease the risk of healthcare-associated infections among patients.

A copy of the Guidelines can be downloaded at www.cdc.gov/ncidod/dhqp/gl_environinfection.html

ENVIRONMENTAL SURFACES

The CDC Guidelines divide environmental surfaces into two parts: *medical equipment surfaces*, such as knobs or handles on machines, carts and similar equipment, and *housekeeping surfaces*, such as floors, walls and tabletops. Housekeeping surfaces can be further divided into those with minimal hand contact (referred to as “low-touch” surfaces) and those with frequent hand contact (“high-touch” surfaces).

The number and types of microorganisms present on environmental surfaces are influenced by:

- Number of people in the environment
- Amount of activity
- Amount of moisture (microorganisms are present in great numbers in moist organic environments, but some can also persist under dry conditions)
- Presence of material capable of supporting microbial growth
- Rate at which organisms suspended in air are removed
- Type of surface and orientation (i.e., horizontal or vertical)



PRINCIPLES OF CLEANING AND DISINFECTING

According to the CDC Guidelines, cleaning is the necessary first step of any disinfection process. Cleaning is a form of decontamination that renders the environmental surface safe to handle or use by removing organic matter, salts, and visible soils, all of which interfere with microbial inactivation. The physical action of scrubbing with detergents and surfactants and rinsing with water removes a large number of microorganisms from surfaces.

After cleaning, attention can be turned to disinfecting the environmental surface. According to

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the CDC Guidelines, the following factors influence the choice of disinfection procedure:

- Nature of the items to be disinfected
- Number of microorganisms present
- Innate resistance of those microorganisms to the inactivating effects of the germicide
- Amount of organic soil present
- Type and concentration of germicide used
- Duration and temperature of germicide contact
- If using a proprietary product, other specific indications and directions for use

OPTIMIZING DISINFECTANT SOLUTION

Careful attention to each step within the disinfection procedure is key to creating the best opportunity for effective disinfection to be achieved and maintained. The first step is the selection of the proper chemical germicide. While a number of disinfectants such as alcohols, hypochlorites, chlorohexidine, iodophors, hydrogen peroxide and phenolics are used in healthcare facilities, many healthcare facilities choose quaternary ammonium compounds (quats) to destroy, inhibit or prevent growth of microbes on surfaces in patient rooms.

Another important step is the mixing and application of the disinfectant. To be effective, it should be mixed according to directions and applied to the surface uniformly. The surface should remain wet for the amount of time recommended by the manufacturer.

The operative assumption underlying the principles of surface disinfection is that the active ingredients capable of rendering microbes non-functional are being delivered to the surface at the correct concentration. Previously underestimated factors, like the type of cloth or wiper used to apply the disinfectant to the surface, may dramatically affect the concentration of quaternary amine delivered to the surface.



EFFECTS OF WIPING MATERIAL SUBSTRATES

A study was conducted to examine the effects of commonly used wiping material substrates (using common industry systems of saturation and disinfection practices) on the amount of active quaternary amines being released to surfaces for the purpose of disinfection. The wiping materials studied were: common cotton rags and disposable cellulose based wipers used with an open-bucket cleaning system and KIMTECH PREP* Wipers for Disinfectants and Sanitizers used in the WETTASK® Refillable Wiping System.

DID YOU KNOW?

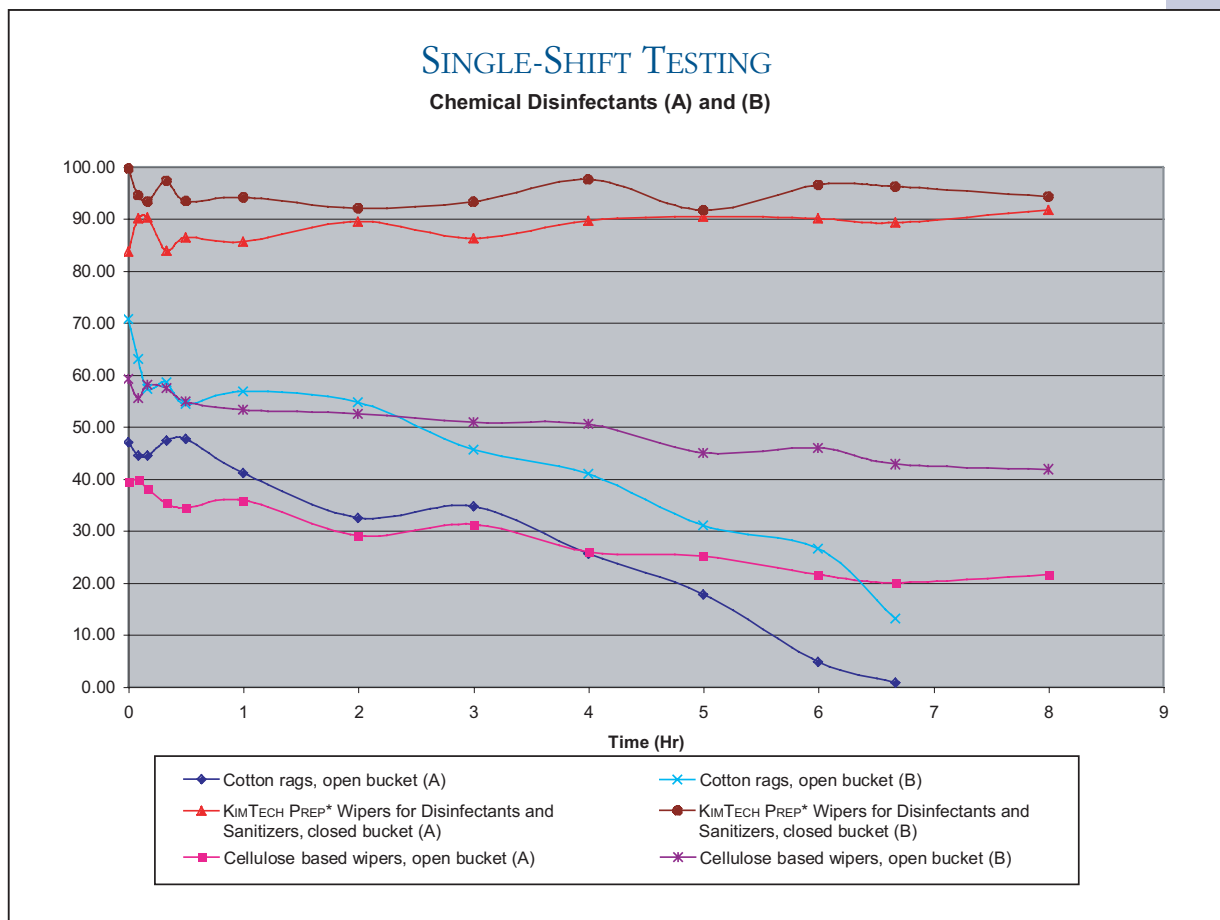
Paper indicator strips are commonly used to check the concentration of quaternary amines in an open-bucket system. *But this practice does not monitor the amount of quaternary amines present in the liquid deposited from the wiper to the surface.*

The cotton rags and cellulose based wipers were tested following a common hospital use protocol in which the wipers are dipped into the open bucket to absorb disinfectant solution to be applied to a surface. The KIMTECH PREP* Wipers for Disinfectants and Sanitizers were used in the WETTASK® Refillable Wiping System (a closed-bucket system with 90 pre-saturated wipers extracted as needed for the purpose of surface application). This system keeps the wipers fresh in the container, pre-saturated with the preferred quat solution, for the period of use.

Systems used for the study – including the length of time the wipers were exposed to the chemical and the number of wipers placed in the chemical at one time – mirror those commonly used in healthcare disinfection applications. Wipers in the closed bucket system remain in contact with the quaternary amine solution for a significantly longer period than those in the open bucket system.

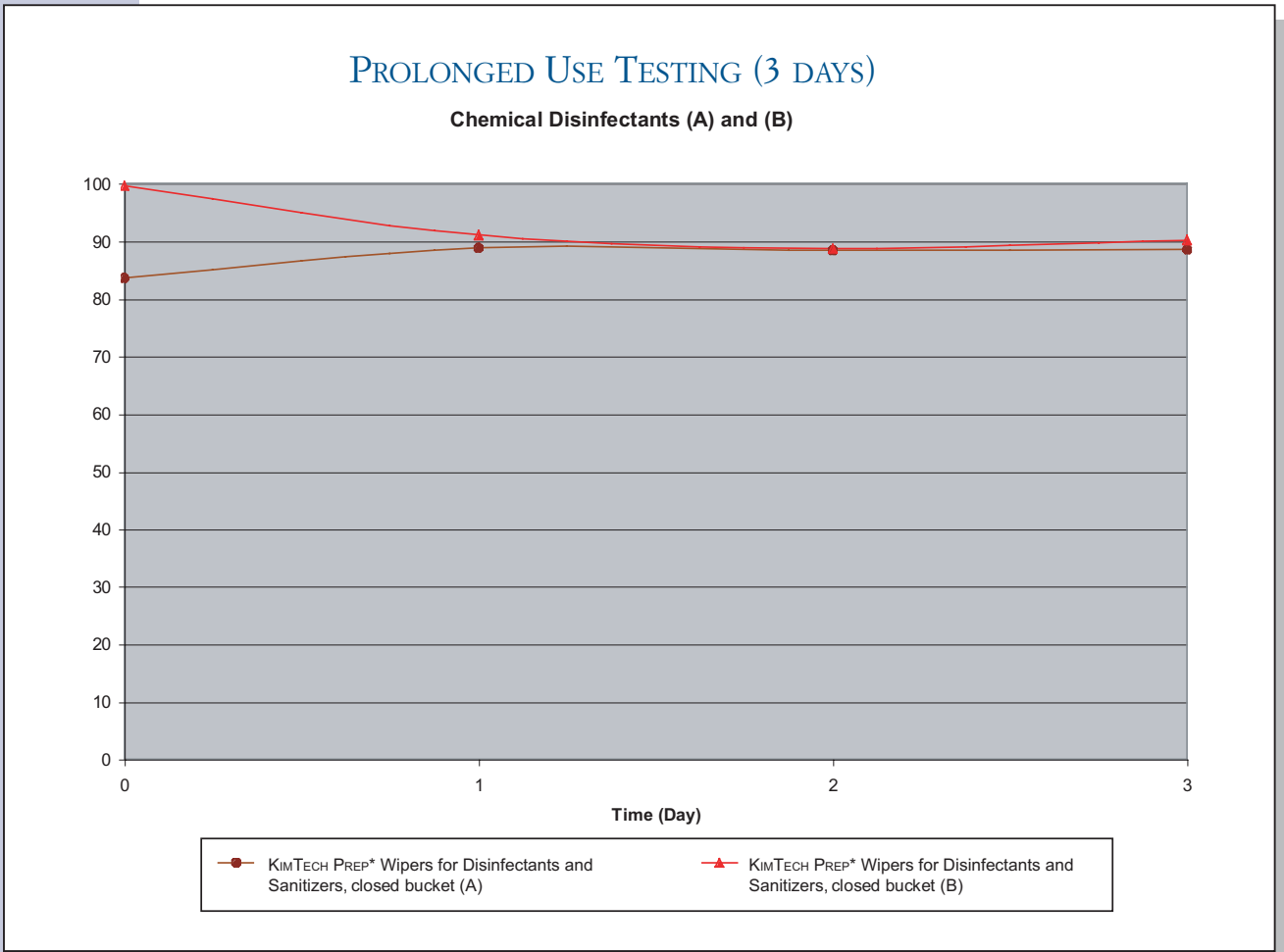
The study results showed a significant decline in the concentration of basic quaternary amines released when cotton rags or cellulose based wipers were used in the open bucket system compared to the KIMTECH PREP* Wipers for Disinfectants and Sanitizers in the WETTASK® Refillable Wiping System.

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- Quaternary amine release for first cotton rag from bucket is 53% lower than original disinfectant solution A and nearly 30% lower for disinfectant solution B.
- In contrast, initial quaternary amine release for KIMTECH PREP* Wipers for Disinfectants and Sanitizers is only 16% lower than original disinfectant solution A and less than 1% lower for disinfectant solution B.





- In extended three-day testing with the KIMTECH PREP* Wipers for Disinfectants and Sanitizers retained an average of 88% of the original Disinfectant A concentration and an average of 94% of the original Disinfectant B concentration.

These results demonstrate that the KIMTECH PREP* Wipers for Disinfectants and Sanitizers would better maintain the target disinfectant concentration compared with cotton rags and cellulose based wipers, even over a prolonged period of use.

SUMMARY AND CONCLUSIONS

The consumption of active quats in these disinfecting practices implies that active disinfecting agents are not always applied to the surface in the ideal concentration to support optimum environmental disinfection.

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The KIMTECH PREP* Wipers for Disinfectants and Sanitizers specifically designed to be compatible with quaternary amine disinfectant solutions maintain the concentration of actives released to the surface at near target concentration levels. The enclosed WETTASK® Refillable Wiping System also helps to avoid the contamination of the wipers and the cleaning solution because it eliminates any opportunity to re-dip wipers into an open bucket.

DID YOU KNOW?

When wipers are re-dipped, bucket solutions become contaminated almost immediately during cleaning, and continued use of the solution transfers increasing number of microorganisms to each subsequent surface to be cleaned. One source of contamination is the cleaning cloth, especially if left soaking in the dirty cleaning solution.

Source: Guidelines for Environmental Infection Control in Health-Care Facilities, CDC, HICPAC.

While some materials currently in use, such as cotton or cellulose based wipers, are far from optimal in their ability to provide disinfectant actives to surfaces in intended concentrations, **use of wiping materials – such as KIMTECH PREP* Wipers For Disinfectants and Sanitizers in the WETTASK® System — that are compatible with the chemicals used in surface disinfection can optimize healthcare infection control practices.**



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