

## A Brief Overview of QUAT Disinfectants

Quaternary Ammonium Compounds - "QUAT" based disinfectants - are a pillar of infection control in healthcare and institutional settings. Benzalkonium chloride was the first commercially available quat disinfectant, introduced in 1935. New generation benzalkonium chlorides (ADBAC – alkyl dimethyl benzyl ammonium chloride) and dual chain quats (DDAC – dodecyl dimethyl ammonium chlorides) continue to be a mainstay in disinfection today. Quats are valuable chemical disinfectants due to their hard water tolerance (upwards of 1500ppm / 90 gpg), detergency, stability, relatively low toxicity and compatibility with other surfactants. Quats have broad spectrum biocidal activity against numerous strains of Gram-positive bacteria, lipophilic (enveloped) viruses and fungi. Quats are NOT sporicidal, tuberculocidal or virucidal against hydrophilic (non-enveloped) viruses. They are safe to use on all common building materials as a hard surface disinfectant for non-critical surfaces.

### What is the difference between CLEANING vs. SANITIZING vs. DISINFECTING?

Let's first look at the definitions:

Cleaning – to make free of dirt, marks and mess, by wiping or brushing

Sanitizing – cleaning something to make it hygienic, by reducing levels of bacteria and disease causing elements

Disinfecting – cleaning with a chemical disinfectant in order to destroy all bacteria and other disease causing elements, including viruses and fungi

All three terms are related, but disinfecting and sanitizing are higher levels of cleaning. Clean is a superficial term referring to apparent cleanliness and absence of soil. Sanitizing requires a 3log10 or 99.9% reduction of bacteria from a surface, but may not affect viruses or fungi.

Disinfecting requires a 6log10 or 99.9999% kill rate of all bacteria, viruses and fungi. There may not seem to be a big difference between 99.9% and 99.9999%, but there is: if you were to start with one million bacteria, a sanitizer would leave 1000 bacteria behind and not kill viruses or fungi, whereas a Health Canada approved DIN product (disinfectant with Drug Identification Number) would be required to kill 100% of the bacteria, viruses and fungi.

General cleaning is typically reserved for low risk surfaces - such as floors, windows and walls - where the likelihood of pathogen transfer is limited. Sanitation is applied to food contact surfaces as part of the Food Code regulations. Disinfection is targeted to frequently touched surfaces that are likely to harbour pathogens in institutional settings, such as hand rails, door knobs and bedside tables in hospitals.

### The 3 C's of Disinfecting: CLEAN, CONTACT and CONCENTRATION

**CLEAN:** It is paramount that the surface to be disinfected is clean for effective biocidal action. This may require pre-cleaning to ensure that soil, proteinaceous material and biofilms are



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removed prior to treatment with a disinfectant. Otherwise the activity of the disinfectant may be overwhelmed, rendering it ineffective to kill all pathogens.

**CONTACT:** Just as a surface must be clean to allow chemical disinfectants access to pathogens, contact time (dwell time) is crucial to ensure that they achieve adequate microbial inactivation. One must follow all of the label instructions on the Health Canada approved DIN product. Failure to do so can contribute to spread of infectious diseases. Most disinfectants require a 10 minute contact time to kill everything. This means that they must remain wet for 10 minutes. Unfortunately, many disinfectants will dry in less than five minutes. Several variables contribute to drying rates, such as application (how much product is added), temperature and airflow (increased evaporation), and composition (alcohol based disinfectants evaporate faster). A disinfectant will often need reapplication to comply with the requisite 10 minute contact time.

**CONCENTRATION:** In addition to contact time, label directions also dictate the dilution ratio required for effective disinfection. The dilution ratio is based on the percentage of actives in the disinfectant and efficacy testing against specific microorganisms. DIN product labels are approved by Health Canada and must be adhered to strictly.

Cleaning staff must be adequately trained to ensure that disinfectants are used properly.

**OSTREM CHEMICAL'S recommended DIN-approved Quat Disinfectants:**

**J464 Lemon Tree** – disinfectant/cleaner

**J465 Ostro San** – disinfectant

**J718 Pure Disinfectant** – ECO LOGO Certified disinfectant

**OSTREM CHEMICAL'S additional Sanitizers :**

**J466 P-250 Pine Disinfectant** – pine oil and alcohol based DIN registered disinfectant

**F366 Organic Sanitizer** – 35% hydrogen peroxide based sanitizer for dairies

**F371 Liquid Chlorine 12% Sanitizer** – general purpose 12% bleach for sanitizing

**T659 Foam Acid Sanitizer** – acidified quat blend for descaling and sanitizing

**T647 Peroxysan 5** – peracetic acid and hydrogen peroxide based sanitizer



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