

Value of Ready-to-Use Disinfectants with Fast Contact Times: Real-world Research Shows Cost and Labor Savings Over Dilutable Disinfectants



Objective

To determine the time, volume of product used, and cost required to disinfect desks with trigger sprays in a K-12 classroom using products with different disinfection contact times. We used Clorox® Clean-Up® Disinfecting Cleaner with Bleach, Clorox EcoClean™ Disinfectant Cleaner, and a dilutable quaternary ammonium chloride (quat) disinfectant to test the hypothesis that longer disinfection contact times may cost more and use more water to disinfect than products with shorter disinfection contact times.

Background and Scope

Historically, disinfecting surfaces accounts for only a small percentage of the tasks a custodian performs every day. Since the COVID-19 pandemic, however, disinfection has become a higher priority for building occupants and facilities. The main time-limiting factor in disinfection is the contact time (CT), or time the product must remain wet on the surface to achieve disinfection. But how much this impacts the labor time has not been determined in a real-world setting.

With this research, we aimed to determine the time and amount of product required to disinfect using liquid trigger sprays with different contact times.

In this study, 11 custodians at The Waterford K-12 School volunteered to participate in our research study using Clorox ready-to-use (RTU) products Clorox® Clean-Up® Disinfecting Cleaner with Bleach (30 second disinfection contact time), Clorox EcoClean™ Disinfectant Cleaner (2-minute disinfection contact time) and a dilutable quat product (10-minute disinfection contact time). We asked each participant to disinfect the 22 desktops in a classroom with each product and ensure each surface stayed wet long enough to meet the required contact time for disinfection, rewetting the surface as necessary if it started to dry. Once the contact time was met, participants wiped the desks dry with a microfiber cloth.

Results

Disinfectant Sprays with a Contact Times of 2 Minutes Saved Time and Required Less Liquid than the 10-minute Dilutable Product

Time and Chemistry Use Required to Reach Disinfection Contact Time with RTU Sprays and Dilutable

Product	Average Time to Disinfect Classroom Desks (mins)	Average Amount of Product Sprayed (oz.)
Clorox® Clean-Up® Disinfecting Cleaner with Bleach (30 sec CT)	3.83 ± 1.28	4.9 ± 2.4
Clorox EcoClean™ Disinfectant Cleaner (2 min CT)	5.1 ± 1.21	7.1 ± 2.5
Dilutable Quat Disinfectant (10 min CT)	13.84 ± 1.1	15.1 ± 3.5

On average, disinfecting the classroom with Clorox EcoClean™ Disinfectant Cleaner took 5.1 minutes. Disinfecting with Clorox® Clean-Up® Disinfecting Cleaner with Bleach took 3.8 minutes. By contrast, using the 10-minute dilutable quat required 13.8 minutes to prepare the solution and disinfect the classroom desks. The reason for the differences in time is due to visible drying on the surface after spraying. In general, 2 minutes after spraying, the desks started to dry, which required the custodians to spray again to keep the surfaces wet. Because of this, longer contact time products also required more product to keep the surfaces wet. To disinfect the classroom, Clorox® Clean-Up® Disinfecting Cleaner with Bleach used 4.9 ounces of product on average, Clorox EcoClean™ Disinfectant Cleaner required 7.1 ounces, and the 10-minute dilutable quat needed 15.1 ounces. Based on this, a standard 32-ounce RTU spray bottle of Clorox® Clean-Up® Disinfecting Cleaner with Bleach could disinfect 6.5 25-desk classrooms, Clorox EcoClean™ Disinfectant Cleaner could disinfect 4.5 classrooms, and a 10-minute dilutable quat disinfectant in a 32-ounce bottle could only disinfect 2 classrooms before needing to refill.

Clorox EcoClean™ Disinfectant Cleaner and Clorox® Clean-Up® Disinfecting Cleaner with Bleach Were More Cost Effective than the 10-minute Dilutable Quat Disinfectant.

Cost to Disinfect a 22-desk Classroom with Clorox RTU Sprays Versus Dilutable Quat Disinfectant



We calculated the cost to disinfect the classroom for each product based on the cost of the product used, the time it took to disinfect, and the national average for hourly labor cost for that time. Based on this, we found that the RTU sprays presented a cost savings of over \$1 per classroom, entirely due to the labor savings. In our study, sprayed surfaces started drying after 2 minutes, meaning that products with a contact time greater than 2 minutes would require re-application of the product, further increasing product and water usage alongside more time to complete the task. Additionally, in the classroom, the time it took to spray all the desks was about 2 minutes, meaning after the custodians sprayed all the desks, then they could immediately go back to the first desk they sprayed and start wiping because the contact time has already elapsed. This process makes it easy for custodians to disinfect correctly.

Discussion

Custodian labor is the largest part of a cleaning operation budget. When disinfection is required, meeting the contact time for disinfection is necessary to ensure surfaces are truly disinfected. Failing to reach the contact time with a single application can lead to stress on custodians, a rushed process or even leave pathogens alive on surfaces. To our knowledge, this is the first study that aimed to measure the impact of disinfectant contact time on time and cost to disinfect a space.

While this study was performed in a school, the results should apply broadly to other areas where disinfecting is needed including offices, restrooms, long-term care and other healthcare facilities. We recommend testing a product's dry time in each space that needs to be disinfected to take note of when surfaces start to dry and how long the task takes depending on the product contact time.

Conclusion

To ensure compliance with manufacturer directions for use and to disinfect quickly and effectively, we found that using a disinfectant with a contact time of 2 minutes or less enabled the most efficient and cost-effective practice to disinfect the classroom. Today, there are both bleach and non-bleach options with disinfection contact times of 2 minutes or less.

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