



CHILD CARE CENTER: SURFACE HYGIENE STUDY RESULTS

Industry Report

Child Care Center: Surface Hygiene Study Results

According to the Centers for Disease Control & Prevention, the average child contracts at least eight colds a year, and children in the U.S. miss as many as 189 million school days each year due to colds. How do we account for these overwhelming statistics?

Illness-causing germs may survive on common classroom contact surfaces (fomites) for as long as 72-hours and be transferred to a teacher's or child's hands upon contact. Considering that small children bring fingers to their face 40 to 60 times an hour, it is evident that children can easily become infected from contact with improperly cleaned surfaces in their classroom environments.¹

Coverall Health-Based Cleaning SystemSM undertook a study in a child care center to determine whether traditional cleaning methods are producing hygienically clean results sufficient to reduce the risk of germ transmission among teachers, staff and students.

Facility Overview – Coverall conducted the study in an early childhood education center located in the Midwest. The center's physical structure encompasses approximately 6,800 square feet and includes nine individual classrooms with six child restrooms and two adult restrooms. The facility also contains two administrative offices and a central full-service kitchen area.

Floor coverings throughout the facility are a mixture of finished vinyl composite tile (VCT) and commercial grade carpeting. Furnishings contained within are consistent with a child care environment.

Currently, the cleaning protocol for the facility consists of company staff executing cleaning tasks throughout the day, with a contracted commercial cleaning service executing cleaning tasks nightly. A subjective perception of the facility indicates a well-maintained and aesthetically clean environment. Based on the researchers' experience, the facility represents an above average child care physical environment.

Testing Methodology – Coverall conducted a comprehensive study of surface hygiene levels at the facility using Adenosine Triphosphate (ATP) readings. The ATP measurement tool provides rapid detection capabilities to read the levels of biological contamination of surfaces. The meter measures ATP, the universal energy molecule found in all animal, plant, bacterial, yeast and mold cells. ATP from a surface sample is mixed with an enzyme to create a bioluminescence reaction, and light is emitted in direct proportion to the amount of ATP present.





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Results are quantified as **Relative Light Units (RLU)**. The higher the RLU reading, the more contamination is present. The following RLU readings are considered benchmarks when analyzing ATP results:

- 10 is the standard measurement for food contact surfaces
- 30 is the standard measurement for food handlers' hands
- Readings greater than 100 represents a level of contamination that can pose risk

The test process consisted of swab sampling a number of surface areas within the facility to determine levels of ATP presence and compilation of an overall risk factor evaluation. Seven sample intervals over four days were conducted. A total of 330 ATP samples were collected and analyzed from the following locations:

- Classroom floors
- Restroom door handles, floors, sink handles and toilets
- Classroom carpet
- Diapering areas
- Children's cubbies
- Classroom tables
- Drinking fountains
- Cribs
- Entry way floor and counters
- Classroom sink handles
- Computer keyboards and mice
- Classroom phones
- Kitchen floors, counters and appliances
- Office surfaces

In addition to the overall ATP evaluation data, a separate sampling was taken on specific surfaces to evaluate performance measures of advanced cleaning system technology.

Interval samples were taken on VCT flooring, children's worktables and table legs. These surfaces were cleaned with advanced cleaning chemistry and soil removal technologies. Results represented significant reduction in ATP levels on all surfaces.





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Data Review – Based on sample readings, the Coverall Health-Based Cleaning System research team established the following data:

- The average ATP RLU reading over the entire study was 375.36 with a median reading of 216
- The following readings were collected:
 - 41 readings collected were at 50 or below ATP RLU
 - 78 readings were between 51 and 100 ATP RLU
 - 250 readings were between 101 and 500 ATP RLU
 - 51 readings were between 501 and 1000 ATP RLU
 - 20 readings were at or above 1001 ATP RLU

Opinions and Conclusions – The physical environment of the day care test facility represents an above average hygiene level as compared to similar child care facilities. Still, specific surfaces represent key points of potential germ transmission as they relate to high levels of overall ATP sample readings. Based on the data set, surfaces that presented an average ATP reading in excess of 300 or more RLU's represent a significant opportunity to decrease risk levels for the facility occupants.

Based on analysis of the data set, the Coverall study team is of the opinion that the cleaning tasks being executed by the facility staff is resulting in effective removal of soils and material.

However, the data would also indicate that many of the applications provided by the outside cleaning contractor are not removing existing soils and are contributing to cross-contamination. This opinion is based on the examination of surfaces and comparison of ATP levels both before and after execution of the outside contractor's services. For example, on day one of the study, the average ATP reading for the entire facility taken at 7:45 PM (after children and staff had left) was over 200 RLU's. Following cleaning services by the outside contracting service, a sample taken at 5:15 AM the next morning (before children and staff arrived) was nearly 400 RLU's. A specific surface that represents the greatest concern is the VCT flooring, for which testing indicated an actual increase in ATP levels after floor-cleaning procedures were completed.

We believe this trend is consistent with the use of antiquated traditional mopping procedures. In addition, the data represents that some of the identified critical control points (such as door handles and sink faucet handles) are not being affected (effectively cleaned to reduce potential health risks) by either the staff or the contractor's cleaning tasks.

Recommendations – To address areas of the facility that represent critical control points of potential germ transfer, the study team recommends that additional tasks be added to both the in-house staff and cleaning contractor's protocol.





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The addition of disposable wipes with an approved disinfectant (of the facility's choice) represents an effective strategy for staff during the day to address areas such as table legs, light switches, door handles, sink handles, keyboards and mice.

Additional tasks such as thorough cleaning and disinfection of all critical control points noted above should be added to the contractor's requirements.

The Coverall Health-Based Cleaning System study in the Midwest day care center shows that improper use of cleaning tools (such as mops and cloths) can result in additional contamination of surfaces. We, therefore, recommend the proper use of health-based cleaning methodologies and use of disinfectants that are essential in reducing the spread of illness-causing microbes.

Study Implications – Proper hygiene and cleaning are effective mechanisms in controlling the spread of infections.² While adults experience two to three respiratory infections per year, children experience double that number. This results in almost one billion respiratory infections per year in the United States, and the cost to society is billion of dollars.³

Good hygiene practices that emphasize proper surface cleaning of day care environments can lower the level of illness-causing germs and help control the spread of infection in school environments. A recent study that called for cleaning and disinfecting the classroom desks of first-, fourth- and fifth-graders after the end of each day demonstrated that absenteeism was reduced by 50 percent compared with classrooms where this was not done.⁴

Additionally, effective hygienic cleaning should also be combined with an effective hand hygiene protocol for all facility occupants for the maximum effect to reduce and minimize disease outbreaks.

Head of Study: Peter J. Sheldon Sr., CBSE, brings over 18 years of experience in the Building Services Contracting industry to his position as Vice President of Operations of Coverall Health-Based Cleaning SystemSM. Sheldon works closely with the Coverall sales and operations teams to spearhead initiatives that further the Company's strategic objectives and help the Company develop the most efficient and innovative cleaning processes available. Sheldon is among the elite group of building service professionals to qualify for the Certified Building Service Executive designation.

1. Gerba, Charles, P., "Healthful Cleaning," American Schools and University, June 1, 2009, <http://asumag.com/Maintenance/infection-control-tips-200906/>.
2. Ibid.
3. Ibid.
4. Ibid.

