



ATP monitoring can help hoteliers restore post-lockdown trust

Most hotels have always looked at their cleaning and sanitation programs with a sense of pride. But with COVID-19, “enhanced hygiene practices” has been adopted by individuals and chains worldwide.

- Hilton’s [CleanStay](#) program, in collaboration with the Mayo Clinic and Reckitt-Benckiser (RB), the makers of Lysol, focuses on cleanliness, safety and practices around food and beverage availability.
- Accor’s [All Meet Well](#) protocol addresses cleanliness of 20 common touch points experienced by guests and meeting attendants.
- Four Seasons Hotels and Resorts’ [Lead With Care](#) program partnered with Johns Hopkins Medicine to introduce enhanced disinfection of guest rooms, employee training, additional food handling protocols, and enhancements to ventilation systems.

As hoteliers begin to pivot from lockdowns, reduced capacity, and guest access restrictions to reopening floors, preparing rooms, and accepting all guests again, they will need to take extra steps to ensure the safety of those guests and the employees who serve them.

Key to that safety will be ensuring that sleeping rooms, conference areas, lobbies and lounges are cleaned and sanitized. While sanitizing surfaces is just a small part of combatting the prevalence of COVID-19, now, hotels need to prove to guests that after the shutdown, their facility is safe place to stay.

Using the right sanitizing products is a sound start to rebuilding trust. The US Environmental Protection Agency

(EPA) maintains a list of approved chemical disinfectants that are not only effective in general, but also disable the complex biochemical coating surrounding the SARS-Cov2 coronavirus. In addition, the US Centers for Disease Control and Prevention (CDC) and World Health Organization issued guidelines on accentuated cleaning efforts on surfaces in hotels (as well as other industries).

However, all sanitizing chemicals listed won’t work if they’re not used correctly. Disinfectants are not designed to remove organic material, whether it be bacterial, viral, or leftover food and other debris. Instead, disinfectants are made to ensure that clean surfaces stay microbe-free. Disinfectant application needs to follow a good cleaning of the surfaces with enough force to actually remove the majority of soils. And even cleaning surfaces can leave gaps that might harbor potential pathogens.

Cleaning and sanitation monitoring technology that uses adenosine triphosphate (ATP), the energy-releasing molecule found in every living cell, has been adopted by hotels and other industries to monitor the effectiveness of this cleaning. ATP monitors provide, in as little as 10 seconds, quantitation of the overall ability of cleaning chemicals and crews using them to clean a surface. ATP monitors deliver data using bioluminescence, read as a Relative Light Unit, or RLU. The higher a RLU, the greater the risk of potential contamination. ATP monitoring doesn’t directly identify bacteria or viruses. Instead, it detects the general presence of organic matter, which bacteria and viruses can use to grow and/or spread. ATP systems therefore can effectively verify the cleaning processes.

Measuring ATP has been adopted in many industries for determining how clean a surface is. One [study estimates](#) that 33 percent of the ATP picked up by monitoring is

microbial in origin. Surfaces will vary according to sources of contamination and frequency of contact, but reducing RLUs often is enough to reduce infection.

Several studies conducted in hospitality environments have shown the value of ATP monitoring. The studies also underscore the fact that issues with contamination have been a part of hotel management long before the arrival of SARS-Cov2:

- A 2015 [study reported](#) in the *Journal of Environmental Health* that almost all hotel room surfaces failed when compared to colony-forming unit (CFU) standards used in other industries. These included headboards, bathroom and room door handles, bathroom and shower floors, sinks and faucets, toilet paper holders, entry carpets, telephone and TV remote keypads. The study tied the 2003 outbreak of SARS in Asia to several guests visiting a doctor who spent the night in a Hong Kong hotel in February of that year. In this study, researchers recommended ATP monitoring as one of “the most appropriate, operationally feasible, and cost-effective” methods for verifying cleaning, and a certain improvement over visual inspection.

Number of Samples Passed Based on Proposed Critical Limits for Aerobic Plate Counts

- Arizona State University microbiologist Luisa Ikner used ATP monitoring in hotels in several studies. She found that, even after cleaning, guest rooms harbored organic material, some of which was bacterial (Table 1). Room phones delivered readings more than three times the baseline “fail” level, and television remote controls were the “dirtiest,” registering more than four times baseline fail levels. Light switches, however, were found to be very clean, as were other commonly cleaned surfaces, like bathtubs and sinks.
- While not hotels in the strictest sense, cruise ships could be treated as essentially floating resorts. Before COVID-19, cruise companies were often beset with outbreaks of bacteria and norovirus, which caused severe intestinal symptoms. A study conducted in 2008 found that ATP monitoring could determine the overall effectiveness of cleaning crews on ships. Other testing methods found that this cleaning did not eliminate norovirus entirely but did correlate with reduced levels of the virus found on ships’ surfaces.

TABLE 1. Number of Samples Passed Based on Proposed Critical Limits for Aerobic Plate Counts

Surface Type	# Items Pass/Total # Samples		
	5 CFU/cm ²	10 CFU/cm ²	50 CFU/cm ²
Room door handle	6/9	6/9	9/9
Main light switch	6/9	8/9	8/9
Entry carpet	3/9	4/9	9/9
Headboard	9/9	9/9	9/9
Bedside lamp switch	5/9	5/9	7/9
Telephone keypad	2/9	3/9	8/9
TV remote keypad	4/9	4/9	7/9
Bathroom door handle	8/9	8/9	9/9
Bathroom floor	5/9	6/9	8/9
Bathroom faucet	7/9	8/9	9/9
Bathroom sink	4/9	6/9	8/9
Shower floor	7/9	7/9	9/9
Toilet paper holder	4/9	7/9	9/9
Toilet basin	5/9	6/9	7/9
Mug	2/3	2/3	3/3
Glove FMC*	2/9	4/9	9/9
Mop FMC*	3/8	3/8	4/8
Sponge FMC*	2/8	2/8	4/8
Curtain rod	6/6	6/6	6/6

Note: For the purpose of these calculations, counts of too numerous to count were replaced with 1,000 CFU/cm².

*FMC indicates that the item is from the maid cart used to clean the room.



Norovirus Study

- A 2018 case study in [Globalization and Health](#) by the University of Hong Kong researchers compared the role hotel guests played in spreading the 2003 SARS virus with the H1N1 swine flu in 2009 (Table 2). In the swine flu outbreak, 300 hotel guests were quarantined in a Hong Kong hotel. In response, that city's Centre of Health Protection issued enhanced hygiene guidelines for hotels and recommended a stronger role for hotels in handling disease outbreaks, including screening, reporting to health authorities and isolating infected guests and workers. Currently, most public health attention on disease spread for the hospitality industry focuses on airlines.

TABLE 2. Norovirus Study

Object	No. evaluated	Pass (<50 RLU)	Caution (51-99 RLU)	Fail (>100 RLU)	Mean ATP (RLU)	St dev (RLU)	Median (RLU)	Max (RLU)
Flush device	39	97.4%	2.6%	0%	5.9	10.2	2.0	53
Shower head	8	100%	0%	0%	10.5	14.2	3.5	34
Bar stools	9	88.9%	11.1%	0%	11.9	22.6	5.0	71
Light switch	18	88.9%	11.1%	0%	12.9	18.1	5.5	61
Phone	15	93.3%	6.7%	0%	14.9	21.8	6.0	83
TV remote	11	81.8%	18.2%	0%	25.4	24.7	19.0	79
Keys	5	40.0%	60.0%	0%	46.2	27.7	54.0	68
Table	54	79.6%	9.3%	11.1%	49.6	115.9	11.0	700
Toilet door handle	19	57.9%	21.05%	21.05%	51.3	51.7	43.0	159
Bar	13	76.9%	7.7%	15.4%	55.7	125.9	9.0	457
Bed	13	76.9%	7.7%	15.4%	56.4	101.1	12.0	294
Toilet seat	11	63.6%	18.2%	18.2%	60.2	95.5	19.0	250
Chair	54	79.6%	9.3%	11.1%	65.9	217.5	24.0	1600
Handrails	58	60.4%	8.6%	31.0%	182.3	395.9	15.0	1849
Toilet tap	39	61.5%	12.8%	25.7%	468.2	1360.3	21.0	6946
Shower holder	24	66.7%	4.2%	29.1%	978.0	2011.7	8.0	6345

Conclusion

Large hotel chains and the American Hotel and Lodging Association now have guidance on reopening hotels and have issued statements on their sanitation efforts, to reassure customers that their properties are safe places to stay. These critical messages at this critical time will require backup—and ATP monitoring will go a long way to providing the reassuring data they need to confidently and safely open their doors to the public.