

# Public cleaning service and utilization of the ATP test in a 'Post-Coronavirus Era'

## Presenter

Manager, New Standard  
Promotion Project (concurrent post),  
Healthcare FM Sales Promotion  
Department, Sales Headquarters,  
AEON DELIGHT Co., Ltd.

Sales Manager  
**Ms. Isoko Ono**



## Introduction

This is a summary of a special lecture explaining changes in an environmental hygienic management project (public cleaning service) after the new coronavirus pandemic given by Ms. Isoko Ono of AEON DELIGHT Co., Ltd. in the 125th Lumitester seminar (video streaming from October 22-November 30, 2020).

## Company overview of AEON DELIGHT

Our company was established in 1972 to manage buildings of the AEON Group. The company has expanded to about 600 hubs nationwide and performs contract management of facilities and cleaning of AEON stores (Photo. 1). Currently, transactions with clients other than the AEON Group account for about 40% of all transactions. We acquire broad knowledge through the management of various facilities, such as commercial facilities, offices, hotels, and hospitals.

There is a wide variety in the main business areas of our company, including a public cleaning service, facility management, security business, material-related business, facility construction business, vending machine business, and support services. The 'public cleaning service' is a core business along with facility management.

This 'public cleaning service' has changed due to the new coronavirus pandemic. Society as a whole has needed to have more forward-looking ways of the "post-pandemic" new life and business and public cleaning services are no exception.

## Contents

- Company overview of AEON DELIGHT ..... 01
- Changes in public cleaning service due to the corona crisis..... 02
- Fusion of New Standard Cleaning and infection control..... 04
- Staff development (education program) ..... 06
- Examples of utilization of the ATP test..... 08



Photo. 1

Examples of a facility managed by AEON DELIGHT

# Changes in the public cleaning service due to Corona crisis

## (1) Relief and safety required for cleaning

Work styles, such as working from home and remote working, have become common. However, it is necessary to gradually re-open workplaces (e.g., offices) and other buildings to maintain social activities.

In addition, there are some businesses, such as stores and accommodation, that are in danger of not even surviving if they are not able to attract people to their business.

How to provide 'places' and 'spaces' of social activity and business with relief and safety is an important task required for public cleaning services in a society facing novel Coronavirus outbreaks.

## (2) AEON announced 'preventive protocol against Coronavirus'

To establish the relief and safety of 'places' and 'spaces', AEON announced the 'Preventive Protocol against Coronavirus' protocol on June 30, 2020 (Photo. 2\*)<sup>1</sup>. In this protocol, 'continuous execution of infection control' and 'execution from the viewpoint of relief and safety of not only customers but also employees' are clearly stated. Especially, clarification of the intention of 'continuous execution' is very important, through which each AEON Group company including AEON Delight, Ltd., incorporated infection control measures in medium- to long-term activities and services.

In addition, the following items were declared as our 'oath of the prevention of epidemics': 1) Execution of preventive measures against epidemics based on expert advice with a sound

<sup>1</sup>: Please understand that the term, 'prevention of epidemics', is used as 'infection control' in a broad sense.



Photo. 2

'Preventive Protocol against Coronavirus' of AEON

scientific basis and the latest knowledge, 2) execution of preventive measures against epidemics by all employees working together, 3) development of an epidemic prevention system with customers, 4) investments in measures to decrease the number of touchpoints used by customers using digital technology and reorganizing facilities to enabling social distancing.

## (3) Measures taken in the period of the spread of infectious disease

In this section, new public cleaning service activities that will be performed after the Coronavirus outbreak are introduced. Our company prepared our 'guidelines for dealing with Coronavirus' a guidance document aimed at the continuation of business and securing the safety of employees in the aftermath of any disclosure that infected persons were present in the facility (currently, the 3rd revision).

The burden that continues after the disclosure and removal of an infected person is 'environmental disinfection'. In environmental disinfection, the activity area in which the positive patients were found is disinfected by trained employees wearing protective clothing (Photo. 3). In case of a positive patient, our company follows the recommendations and instructions stipulated by the health center. However, early in the pandemic, there was little available information, such as infectivity and mortality rates, and 'a thorough disinfection exceeding the instructions from the health center' was requested by customers. I realized that consideration for our customer's 'emotional well-being and need to feel secure' may be more necessary than a sole focus on 'rationality' in infection control by only considering invisible bacteria and viruses.

Currently, we are at a point of settling on a new cleaning method that is both effective and sustainable while eliminating any unnecessary effort and expense. (This new cleaning method is described below).



Photo. 3

A scene of environmental disinfection



#### (4)Current measures: Introduction of New Standard Cleaning(NSC)

At present, our company is dealing with reimagination of our business model in which both intangible (e.g., cleaning specification) and tangible items (e.g., the use of non-contact equipment) are divided and harmonized to the needs of a post-coronavirus environment.

##### ①Intangibles

The new cleaning specification was termed 'New Standard Cleaning' (NSC) and contains the following three key items as its fundamental principles: 1) Displayed cleaning, 2) Reliable cleaning, and 3) Support for self-defense. (Fig. 1).

'Displayed cleaning'; cleaning conducted in a way that is as easy to understand as possible and is aimed including consideration of the emotions and feelings of customers. The final goal is to be able to understand what work is performed by what kind of person by just looking at their uniforms and cleaning tools.

The term 'reliable cleaning' refers to the use of tools and products (e.g., detergents) with proven and reliable efficacy and with the capacity to prevent human errors. This change was based on the recognition that our previous cleaning methods tended to 'overemphasize the appearance or aesthetics' and 'prioritize the cost'.

'Support for self-defense' means making facility employees and users able to perform what we call *self-defensive cleaning*. This is based on the realistic idea that prevention plays a role in the process and 'infection cannot be prevented by cleaning alone'. We found in a demonstration experiment that when AEON store employees were provided with materials (e.g., disposable wipes, alcohol, etc.) for their own personal hygiene and the cleanliness of their work areas (i.e., *self-defense*) hygiene tended to improve.

##### ②Tangibles

Another demonstration experiment to show the effect of tangible renovation projects, such as installing ventilation equipment and non-contact doors in existing stores is currently underway.

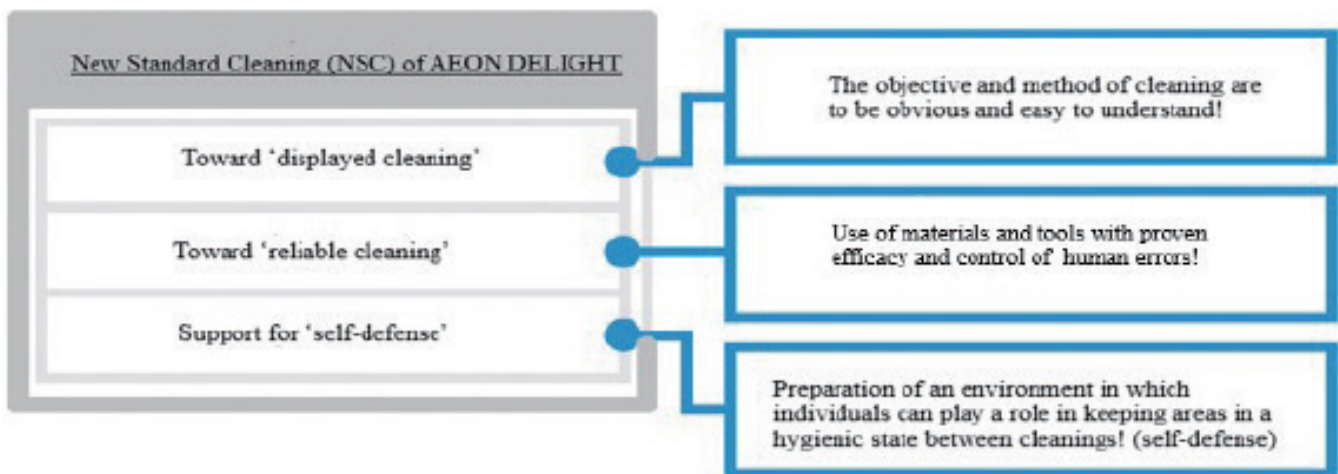


Fig. 1 Three directions of NSC



# Fusion of NSC and infection control

## (1) Shift from attaching greater importance to aesthetics to 'aesthetics + infection control'

The previous purpose of cleaning general facilities was to maintain a 'good appearance' (i.e., aesthetics). Of course, keeping facilities looking clean is important, but the purpose of our work has been expanded to include infection control in NSC (i.e., aesthetics + infection control) and is based on the 'hygienic cleaning' that is performed in hospitals.

## (2) Incorporation of standard preventive measures into cleaning

In order to effectively meet the rational specifications for inspection control, the basics of the standard prevented measures used in nosocomial infection control were incorporated. Nosocomial infections are often likened to an "iceberg" where 'the source of the problem is hidden'. In a case where the condition is an infectious disease revealed by examination of only limited persons (i.e., "the tip of the iceberg"), the real magnitude of the problem likely lies in infected persons who are not tested, in whom the pathogen is undetectable, or persons infected with an unknown infectious disease who may remain "hidden under the water". For these reasons, it is necessary to always consider that 'there are innumerable undetected sources of infection'.

Consideration of these undetected risks and consistently taking preventive measures should be the guiding principle of preventing the infections of oneself and others.

## (3) Integration of the main points of standard precaution to "3 key words"

The following 9 items are included in the points of standard precaution in a medical setting: 1) hand hygiene, 2) use of personal protective equipment, 3) environmental improvement and handling of linens, 4) prevention of blood-borne infection (e.g., needlesticks), 5) respiratory hygiene/coughing manners, 6) handling of equipment, tools, and apparatuses used for patient care, 7) arrangement of patients, 8) safe injection technique, and 9) infection-preventive measures in lumbar puncture.

In NSC, first three of these are the cleaning-related items and are the program's focus and these are expressed as "key words" to better organize the points and make them easier to understand and relate to.

We decided to categorize cleaning related items into three.

1) Hand hygiene, 2) use of personal protective equipment, 3) and environmental improvement. The three categories were converted to keywords, 'avoid contact', 'exposure', and 'remove' microorganisms respectively and incorporate them into the field (Fig. 2).

In previous operations, 'the inconsistent use of gloves and a focus on speed rather than effectiveness' were pointed out as issues that in some cases needed to be addressed. However, our procedures changed through a fusion of our operations with these new considerations of standard precautions.

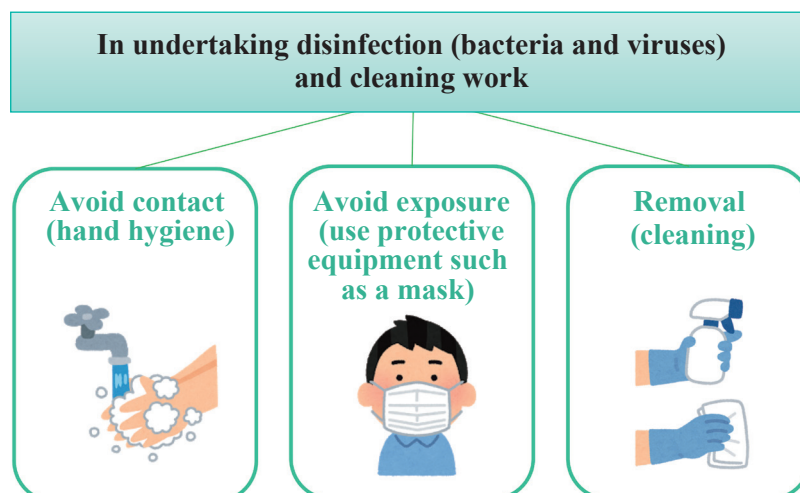


Fig. 2 Expression of the main points of NSC as simple key words



#### (4) Reliable cleaning of high-touch surfaces is important

As shown in [Table 1](#), standard precaution-incorporated NSC is a program requiring firm preparation and a more faithful execution when compared with previous processes. We are planning to improve our written materials, education, closely examine the tools we use and formulate solid rules for the use of the ATP test for quality evaluation.

Our change to NSC is a drastic reformation for our cleaning staff and the adoption of this new culture is not as simple as reading the applicable. Getting staff to adhere to the new

practices takes time and discipline and this is especially true in difficult tasks such as the reliable cleaning of high-touch surfaces. A “high-touch” surface is a term describing places and parts frequently touched with human fingers (e.g., handrails, light switches, doorknobs, etc.). To reliably clean these surfaces that at first glance may not appear dirty takes a level of discipline and the understanding on the part of each person doing the work. This takes a clear sense of purpose, with effective staff education plays an important part in developing this work ethic.

	Previous Cleaning	VS.	New Standard Cleaning
Purpose	Aesthetics		Aesthetics + Infection control
Target	Floor surface, Windows		Floor surface, Windows High-touch surface
Material	Cost-effectiveness		Cost-effectiveness but with efficacy for hygiene and anti-microbial effect
Procedure	Attaching greater importance to efficiency (speed)		Attaching greater importance to hygiene (Elimination of cross contamination)
Quality	Qualitative evaluation (visual)		Qualitative evaluation (visual) Quantitative evaluation (ATP)

**Table 1** Difference between new and old cleaning specifications

# Development of staff (education program)

## (1) Step-up education program

Prior to the launch of NSC, we operated an education program comprised of three levels 1) Basic course, 2) Standard course, and 3) Advanced course.

The basic course includes all cleaning staff, and the focus is on execution of reliable NSC (routine cleaning) and personal hygiene.

In the standard course, they learn specific procedures for infection control-related cleaning and focus on the application of these techniques to high-touch surfaces. They also learn how to use and apply the ATP test. Individuals who have completed and passed the exam of the standard course acquire the right to wear the designated clothes shown in Photo. 4. This leads to the motivation of staff.

The advanced course targets those in managerial positions, and they develop a deeper understanding of the principles of NSC, including, for example, the difference between hospital cleaning and infection control of commercial facilities and offices.



Photo. 4  
Clothes designated for staff who have completed the standard course



## (2) Educational devices

To expand the applicability of the training to diverse types of practice sites, staff can continue their education through online training and conventional textbook methods. The content is delivered primarily using short video instructions as the curriculum is geared toward visual learning.

An example of the educational content can be seen below. The question asked in Fig. 3, in the actual video there is a commentary narration. Trainee must understand the principle of the cleaning procedure (i.e., 'clean part → unclean part') in order to answer correctly. The correct answer is to first clean 'parts touched by hands' (e.g., arm rest, upper part of the backrest). They should also be able to identify that since the degree of cleanliness is equivalent between an arm rest and backrest, the order in which they are cleaned is irrelevant. They then need to be able to explain that the leg parts are wiped next. Since the potential for contamination of the contact area parts at a level of about 50 cm above the floor may be higher, these are cleaned after wiping the clean areas. Then, they are asked 'What to do when there are two chairs? What is the order of cleaning?'. To correctly answer this question, it is again necessary to understand cleaning principles and to use cleaning tools appropriately.

### Question

To wipe this chair, what part do you wipe first and what part do you finish?



Fig. 3  
Understanding of 'rule and principle' is important in education



### (3)Preparation of tools unlikely to cause human errors

Failures cannot be prevented by education alone. The selection and use of tools that reduce the incidence of human error is also important. Our company has developed unique tools to address this need. For example, when a cleaning cloth gets dirty, it is refolded, and a new clean surface is used (this method is termed 'refacing'). To prevent making a mistake when keeping track of which side to use in refacing, we prepared numbered cloths. In addition, we also prepared color-coded cloths corresponding to the degree of cleanliness of the area to reduce the risk of cross-contamination during cleaning (Fig. 4).

We are constantly considering methods which enable staff to gain knowledge and a sense of purpose and creating devices unlikely to cause human errors.



Fig. 4 Selection and development of tools unlikely to fail

### (4)Important points to be considered in the confirmation test

To measure the effectiveness of our education program, each stage is confirmed by a confirmation test (completion test).

In the preparation of questions for the confirmation test, it is not necessary to set irregular or difficult questions. It is important, however, to be able to confirm that the trainee understands the basics of the material and the principles we are looking to transmit to them. If too many participants cannot answer correctly (low correction rate), or too many answer correctly (high correction rate) it is necessary to review the education content or improve the questions. Ranking is not the purpose of education. Our goal is for the training to be practically useful education in a flexible manner to develop members able to correctly practice NSC as well as possible.

### (5)Preparation of a specific work manual (embodiment of work)

If education is to have them understand 'the way of thinking about work', a work manual is to give them direction of specific work. Our training manuals were renewed in conjunction with the development of NSC. In the example shown in Photo. 5, yellow and red colors indicate the colors of the clothes to be used in that place.

In this manual, cleaning range is stated with each cloth color. The environment of the targets of cleaning has diverse shapes. The intention may not be conveyed by simply saying 'wipe the garbage can'. Specific instruction is essential.

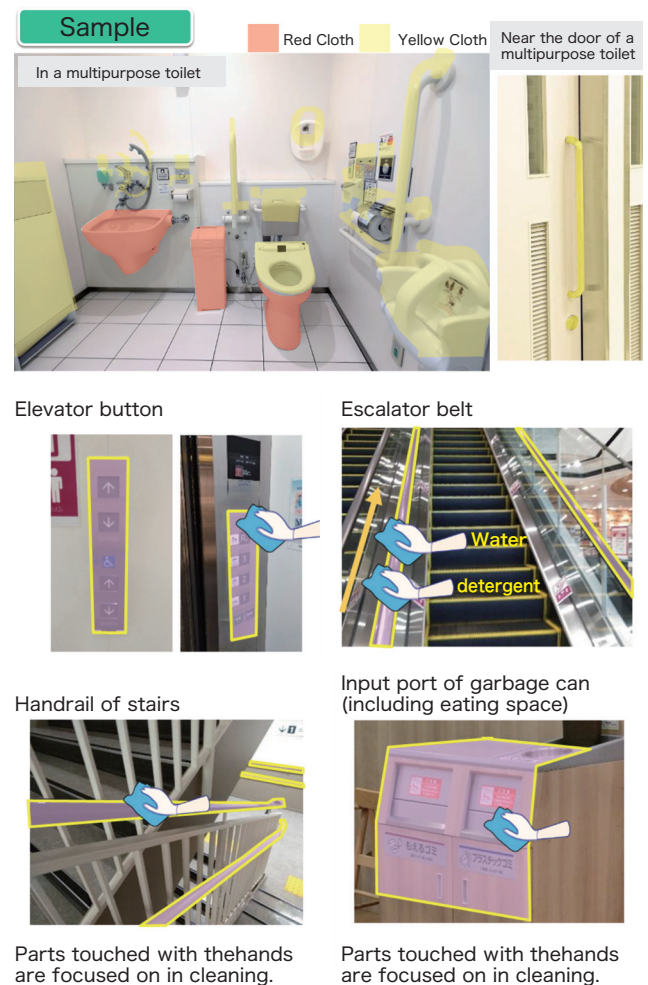


Photo. 5

Renewal of the manual clarifying the method and range of cleaning



# Examples of using the ATP test

## (1) The ATP test is also utilized for the evaluation of cleaning of general facilities

The ATP test plays an important role as a practical quantitative evaluation method in the NSC process.

The ATP test is not a method to directly quantify bacteria and the test result may fluctuate due to the nature of the materials of the surface being tested. Therefore, although it has been used for years in medical settings and kitchens, its use in general facilities has not been established. However, because the test can produce a result in about 10 seconds and provide quantitative feedback provide to the user, the ATP test provides a clear advantage over other inspection methods.

Thus, we decided to first select commercial facilities, amusement arcades, and movie theaters as model practice sites and use the ATP test to survey the current situation, investigate specifications (planning), and confirm the validity of the method.

## (2) Procedure of preparing a cleaning specification

The development of a cleaning specification (cleaning method, cleaning tool, cleaning frequency, etc.) is proceeded in the flow chart shown in Fig. 5: Field survey→ planning, on-site verification→ confirmation of validity. The ATP test is effective in investigating and validating the current status.

Some actions taken by our company are introduced below.

### ① Field survey

In the step of investigating the specification of NSC, the ATP test was performed at a total of nearly 1,000 sites (an example is shown in Fig. 6). In this investigation, we uncovered a trend that when the surface is hard, it is easier to keep the surface clean after cleaning. Softer surfaces were easily accumulating soils and more difficult to keep clean.

### ② Planning of a cleaning specification

Based on this knowledge, tentative cleaning specifications were prepared with the expectation that they would be optimized in practice (e.g., cleaning soft surfaces with certain patterns or designs (embossing) will require an increased cleaning frequency).

### ③ Validation

After preparation of the tentative cleaning specification, confirmation of cleaning efficacy is completed using the ATP test (as shown in Table 2). It is important to optimize the cleaning and testing plan using Plan-Do-Check-Act (PDCA) methodology.



Measuring instrument 'Lumitester Smart' and measurement reagent 'LuciPac A3'



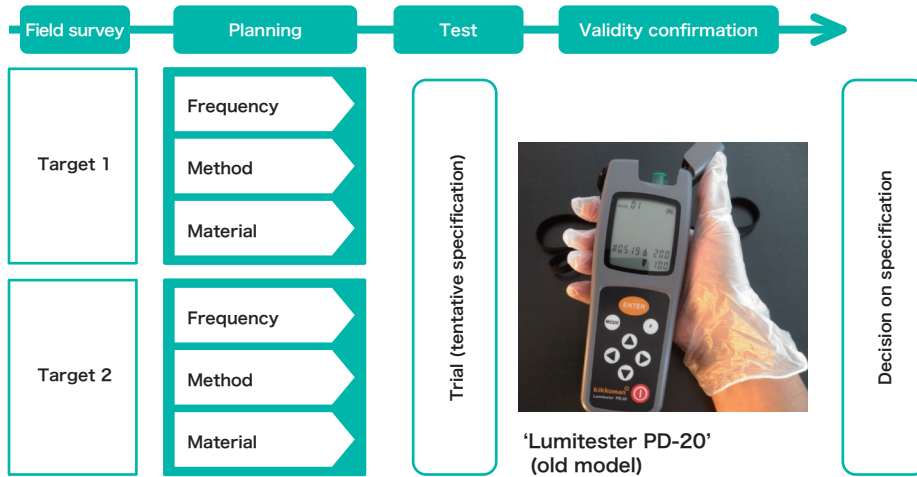


Fig. 5 Specification construction of the ATP wipe test

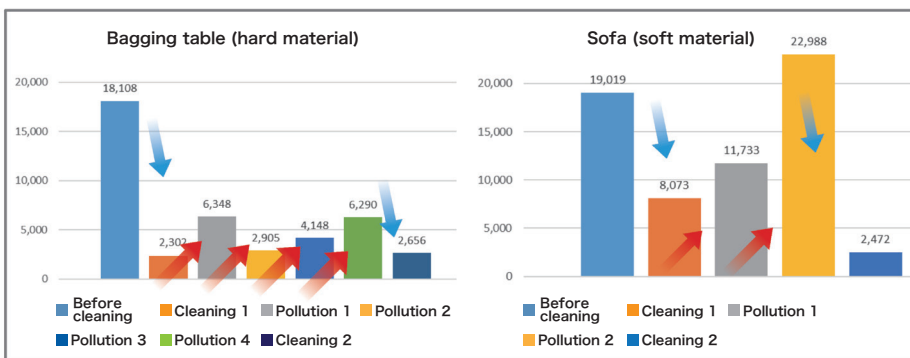


Fig. 6 Cleaning effects on hard and soft materials and tendency of uncleanness accumulation

Unit: RLU \*avg.  
LuciPac A3 Surface was used










	Before cleaning		After cleaning
Shopping basket	17626 	Cleaning following the tentative specification by material  Confirmation of improvement of the value	751 
Sofa	56120 		3105 *Soft material 
Escalator handrail	16140 		531 
Toilet seat operation button	3766 		996 

Table 2 An example of confirmation of the validity of cleaning specification by ATP test



### (3) Specification and effect (merit) of the ATP test

The program calls for conducting ATP tests once a month. Three sites are to be tested, 1) the operation board of warm-water washing toilet seat for customers, 2) the call button of the passenger elevator, and 3) the handrails of stairs used by customers. Other selectable parts are also set (Table 3). The testing of the selected parts will be continued for at least 6 months and adjustment and optimization in the threshold values will be confirmed.

Table 4 shows the format of the ATP test report. The initial threshold standard is set at 3,000 RLU with lower targets

adopted provisionally as changes from the previous testing are evaluated. This comparison allows for the focus on the program to be “continuous improvement” with progressively cleaner levels being achieved over time.

The fact that the ATP tests produces quantitative results is useful in various scenarios, such as validating that a proposed improvement to a cleaning method is actually an improvement, and measurement of continuous improvement of the staff’s cleaning performance and motivation through the feedback from quantitative measurements.

#### Periodic inspection (as of 9/30/2020)

##### Indispensable parts

Point	Fixed point
Toilet for customers	①1 part of operation board of warm-water washing toilet seat
Elevator for customers	②2 parts of call button
Stairs for customers	③1 part of handrail



##### Selected parts

Handrail of stairs
Input port of garbage can (including the eating space)
Chair
Sofa (large) armrest* 2-seat or larger
Sofa (small) armrest* 1-seat
Handle of coin-operated locker (locker for customers)
Refrigerator (freezer)
Handle of locker (locker for customers)
Handle of cart locker (locker for customers)
Vending machine buttons
Input port of recycling container
Bagging table
Handle of basket/cart
Handle of frozen food display case
Acrylic glass of self-checkout
Handle of dry ice/ice machine
WAON Station touch screen
ATM touch screen
Buttons of capsule toy
Outlet port of umbrella box
Buttons of parking fee adjustment machine
Buttons of parking lot ticketing machine
EV Station charging port

Table 3  
Items of periodic testing (as of September 30, 2020). The selected parts can be selected depending on the state of the practice site

#### New Standard Cleaning ATP Monitoring Record

Site name \_\_\_\_\_  
Date \_\_\_\_\_  
Time \_\_\_\_\_  
Name of inspector \_\_\_\_\_

				Initial value	1st		2nd		3rd		4th		5th		
				June	June		July		August		September		October		
				Before cleaning (unclean)	After cleaning		After cleaning		After cleaning		After cleaning		After cleaning		
Number	Handling	Area (Fixed point)	Inspected parts (Fixed point)	RLU value	Mean	RLU value	Mean	RLU value	Mean	RLU value	Mean	RLU value	Mean	RLU value	Mean
1	Basic	Toilet for customers	Operation board of warm-water washing toilet seat	5000	3000	5500	2750								
2	Basic	Toilet for customers	Operation board of warm-water washing toilet seat	6000	2500										
3	Basic	Customers	Elevator button	2000	2250	2500	2750								
4	Basic	Customers	Elevator button	2500	3000										
5	Basic	Customers	Handrail of stairs	5000	4500	5000	5500								
6	Basic	Customers	Handrail of stairs	4000	6000										
7	---														

① Better than that in the previous monitoring + mean of 3,000 or lower → left in white  
 ② Better than that in the previous monitoring + mean of 3,000 or higher → colored yellow  
 ③ Worse than that in the previous monitoring + mean of 3,000 or lower → colored yellow  
 ④ Worse than that in the previous monitoring

Table 4  
An example of the ATP wipe test report. It is devised so as to be able to intuitively grasp changes from the value (RLU value) in the previous test



#### (4)Appendix: Verification of the effect of the ATP test as 'support for self-defense'

Another benefit to the use of the ATP test was found in the improvement of the cleanliness levels in employee areas within stores.

One of the principles of NSC that we discussed earlier is "self-defense" (Fig. 1). We found that when disposable wipes and alcohol-based sanitizers were provided to the employees in a store, the values of the ATP tests collected in those areas

progressively decreased (Table 5). The employees were able to assist in the maintenance of a cleaner environment because they had the tools to keep the area cleaner on their own. We will continue to use this principle to support the continuous improvement of the cleanliness of our facilities and to enlist the help and support of employees in their own self-interest.

ATP target sites		ATP value			
		Before	Aug, 3 (Mon)	After	Sep, 9 (Wed)
Employees break room	Desk	7,834		775	↓
	Desk	10,548		235	↓
Checker's break room	Switch of air conditioner	13,513		247	↓
	Telephone	22,783		4,981	↓
Dressing room (3F)	Bench	66,282		52,341	→
Food floor room	Printer	13,864		7,808	↓

LuciPac A3 Surface was used.

**Table 5** An example of verifying the effect of 'support for self-defense' by the ATP test



## Kikkoman Biochemifa Company

2-1-1 Nishi-Shinbashi, Minato-ku, Tokyo 105-0003, Japan

E-mail: [biochemifa@mail.kikkoman.co.jp](mailto:biochemifa@mail.kikkoman.co.jp)

URL: <https://biochemifa.kikkoman.com/e/>