

# ATP+AMP Hygiene Monitoring System

## Lumitester™ PD-30 & LuciPac™ Pen

Invisible contaminants detected anywhere, anytime, by anybody in mere 10 seconds

**Ultrahigh sensitivity attained with  
ATP plus AMP detection**

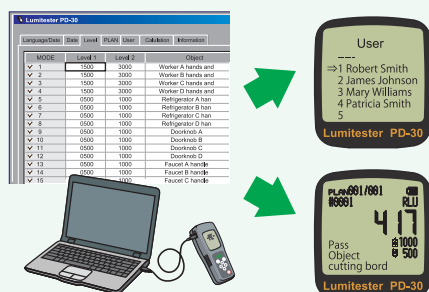
US Patent No. 5891659



### Instrument Lumitester PD-30

#### Data Analysis Software

The upgraded data analysis software allows you to match the testing mode to various measurement sites and situations.



#### Temperature Compensation

Select this function for stable measurements at 10-40°C.



#### Self-Diagnosis

Check cleanliness of the measurement chamber of the Lumitester PD-30.

#### 8 Language Display Options

Select the display language from the eight languages provided. This facilitates the use of the Lumitester PD-30 overseas.

- English •German
- French •Spanish
- Korean •Japanese
- Chinese (both simplified and traditional)



**A soft case that allows  
for upright positioning.**

It's easy to carry and resists soiling.

### Reagent Devices

#### Surface Tests

Integral type inspection reagent with swab stick

**LuciPac Pen**



#### Water Tests

Integral type inspection reagent with sampling stick

**LuciPac Pen -AQUA**

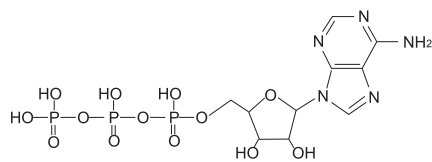


# Principle of ATP plus AMP detection

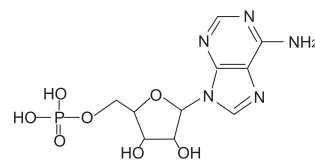
## What is ATP? What is AMP?

ATP (adenosine triphosphate) is the primary molecule involved in metabolism in all living organisms. AMP (adenosine monophosphate) is derived from ATP during the processing, such as heat treatment and fermentation.

**ATP**  
(adenosine triphosphate)



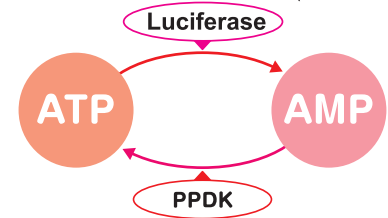
**AMP**  
(adenosine monophosphate)



## ATP cycling method

Kikkoman has created a method using the ATP regeneration enzyme PDK to measure both ATP and AMP as part of the ATP cycle. This method provides enhanced sensitivity.

(US Patent No. 5891659).

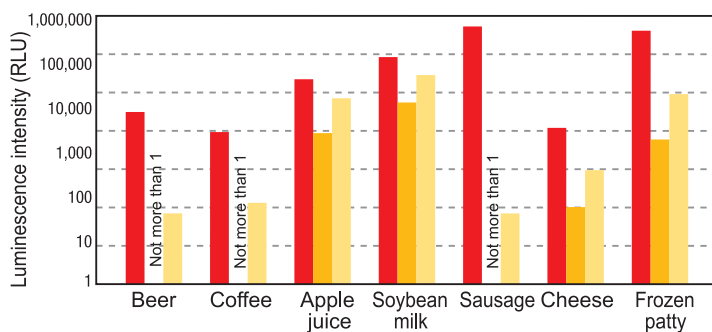


\* PDK...Pyruvate orthophosphate dikinase

## Achievement of super-high sensitivity with both ATP and AMP detection

### Measurement examples of various kinds of food residues

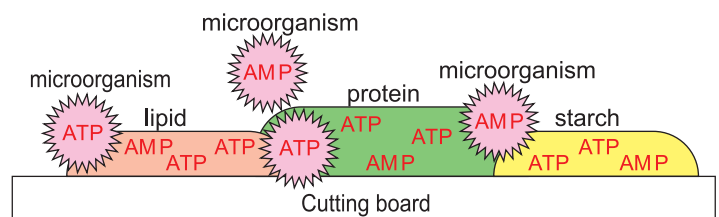
■ ATP+AMP method (Kikkoman) ■ ATP method (brand A) ■ ATP method (brand B)



Measurable even with food residues containing little ATP, such as beer and sausage.

### Object to be measured

In ATP+AMP hygiene monitoring, the degree of contaminant is measured using as total ATP+AMP, which microorganisms and food residues have. ATP+AMP is present in microorganisms, food residues, etc. and as such is an excellent indicator of biological contamination.



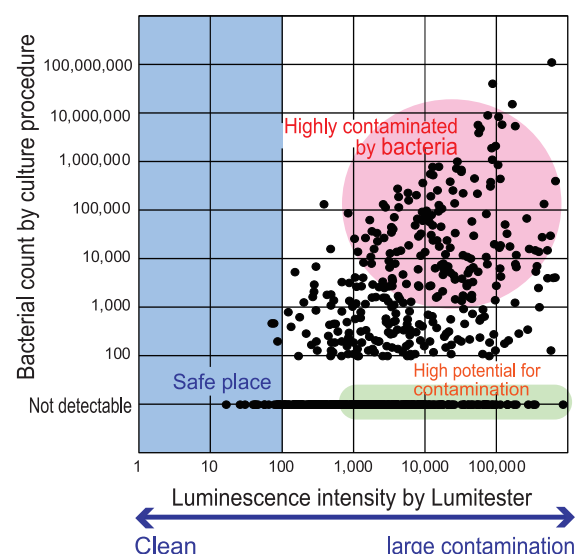
## What is the clean state? Ideal cleanliness - All the soil are removed away, not only bacteria but also food residues.

### Difference in risk perception

| ATP+AMP method CONCLUSION   | Cutting board contamination condition         | Conventional method (culture procedure) CONCLUSION   |
|---|---|--|
| Contaminated  | <p>Cause of microorganism proliferation</p>   | Contaminated   |
| Contaminated<br>Potential risk of microorganism proliferation is able to be detected. | <p>Defective cleaning condition</p>           | No contamination<br>Possibility of overlooking potential risk of microorganism proliferation |
| No contamination  | <p>Both cleaning and disinfection are OK.</p> | No contamination   |

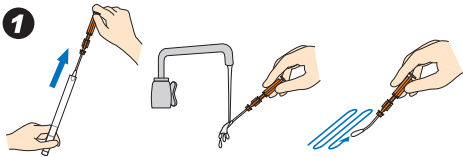
When food residue is present, there is a possibility for microorganisms to proliferate quickly. The conventional culture procedure can detect microorganisms but the ATP+AMP method also detects food residues. Consequently, ineffective cleaning can be accurately determined.

### Correlation between bacterial counts and ATP+AMP level

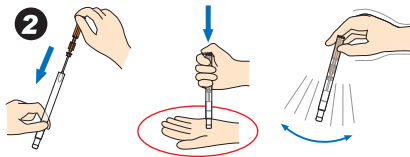


Clean condition is free of microorganisms and food residue (lower luminescence intensity).

## Measurement procedures - for LuciPac Pen \*Please refer to our website for LuciPac AQUA and LuciSwab)

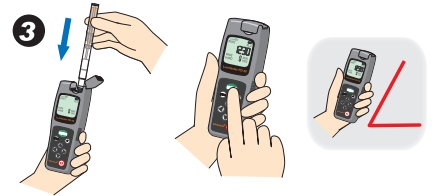


Wet the cotton swab with tap water (or distilled water if required) of the LuciPac Pen. Wipe the object/sample with the swab.



Pressing the bottom by palm or against a table.

Return the swab stick back into the main body of the LuciPac Pen. Push the swab stick thoroughly into the main body. Shake down the liquid stored midway in the LuciPac Pen. Shake well to thoroughly dissolve the powdered reagent.



Measure the cleanliness indication by inserting the LuciPac Pen into the measurement chamber of Lumitester PD-30. Press "ENTER" key of the Lumitester PD-30 to start measurement.



- ① Recommended test timing is **just after cleaning**.
- ② Please use the LuciPac Pen when it **reach to room temperature**. - it takes about 20min
- ③ In the event that alcohol or other disinfectants remain on the surface to be swabbed, results may not be accurate. It is recommended to carry out the test after washing and **before using disinfectants**. If the test is conducted after using disinfectants, rinse the surface with water or wipe it with paper towel, and conduct the test.
- ④ **Make sure to remove** the LuciPac Pen from the Lumitester PD-30 once measurement has been completed. If the Lumitester PD-30 is stored while the LuciPac Pen is left in the instrument, fluid of LuciPac Pen may leak out and **damage the Instrument**.



Use the soft case to stand it if possible. If the soft case is not used, keep inclined angle more than 60 degrees.



Pen-AQUA

## Operation example of ATP+AMP hygiene monitoring

### Determination of test locations

Test locations should be established at the following points:

- Areas difficult to wash and easy for contaminants to remain.
- Areas where not only cleaning but also disinfection and sterilization are conducted.
- Areas in contact with ready to eat foods.
- Areas at risk of cross-contamination, such as hands and fingers of employees. etc.

〈Manufacturing line〉

Valve portions and joints where contaminants are likely to remain.

〈Environmental inspection〉

High-frequency contact locations such as telephone sets, door knobs, keyboards and mice of personal computers, etc.

\*For details, please refer to our website archive, "Uncover issue on-site and establish benchmark values in 20 days"

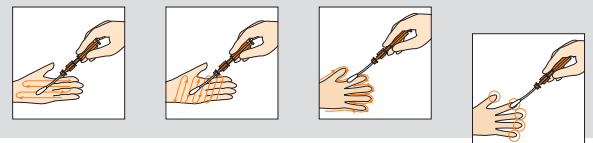
\*Individual swabbing method should be determined for each object.

### Benchmark values and procedure for swab test (example)

- ▶ Hard and smooth surfaces : **stainless, glass, etc. 200RLU**
- ▶ Other surfaces : **surface susceptible to scratches (plastic, resins products, etc.) 500RLU**
- ▶ Large sample : **Swab typical 10 cm square area in every direction**
- ▶ Small sample : **Swab whole evenly**

〈Hands and fingers〉

Swab every direction of the palm, between fingers, fingertips, etc. The pass and fail levels are 1500 RLU and 3000 RLU, respectively.



### Operation example

Please refer to the table below.

| Portions for the test | (RLU) | Swabbing method   |
|-----------------------|-------|---|
| Cutting board         | 500   | 10 cm square around the center  |
| Colander and bowl     | 200   | 10 cm square of the center bottom portion and top end portion of the inside |
| Kitchen counter       | 200   | 10 cm squares at five points on the surface                                 |
| Knife                 | 200   | Both overall blade surfaces, joint between handle and blade                 |
| Stainless vat         | 200   | Corners where contaminants are likely to remain.                            |
| Round pot             | 200   | Three inside areas (bottom, middle stand, upper stand)                      |
| Refrigerator (handle) | 200   | Inside and outside of the overall handle                                    |
| Refrigerator (inside) | 500   | All directions of 10 cm square at the shelf center                          |

| Tested places       | Pass/Fail levels (RLU) |         | First measurement |         | Improvement measures | Second measurement |      |
|---------------------|------------------------|---------|-------------------|---------|----------------------|--------------------|------|
|                     | Level 1                | Level 2 |                   |         |                      |                    |      |
| Hands and fingers   | 1,500                  | 3,000   | 2,412             | Caution | Re-cleaning          | 1,323              | Pass |
| Cutting board       | 500                    | 1,000   | 760               | Caution | Re-cleaning          | 349                | Pass |
| Bowl                | 200                    | 400     | 174               | Passed  |                      |                    |      |
| Kitchen counter     | 200                    | 400     | 130               | Passed  |                      |                    |      |
| Vat                 | 200                    | 400     | 44                | Passed  |                      |                    |      |
| Refrigerator handle | 200                    | 400     | 820               | Failed  | Re-cleaning          | 101                | Pass |

Setting of Pass/Fail criteria

Not more than level 1

- **Pass**

More than fail level 2

- **Fail**

Between level 1 and level 2 - **Caution**

<Note>

- These recommended values are not always applicable to any locations. The goal is to set reasonable targets that can be met with rigorous testing and proper cleaning.
- Decide a swabbing method in accordance with the material and shape of the location to be examined and implement.



# Now you can ensure a clean environment and raise worker awareness of better hygiene.

## Work toward to permanently eliminate the risk of food poisoning with Lumitester.

- The ATP swab test is listed in the Guidelines on Food Hygiene Testing 2004 supervised by the Japanese Ministry of Health, Labor and Welfare.
- The ATP swab test is the first step toward attaining HACCP.

### Restaurants and Institution Kitchens

#### Prevent secondary contamination with the most sanitary practices.

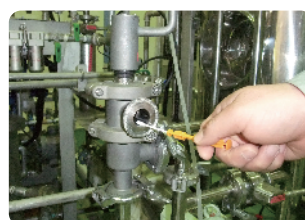
- Perform on-site and instant measurement of cleanliness conditions. If an unsafe cleanliness level is indicated, perform additional washing to prevent secondary contamination.
- A numerical display of test results allows effective cleanliness management, comparing readings from different shops, sites, etc.



### Food Processing Plants

#### Measure the cleanliness of your production sites.

- For effective and accurate checks after daily washings. In emergencies, pinpoint any contamination site rapidly.
- Thorough washing reduces the amount of residual allergens and contaminants.



### Hygiene Education

#### Conduct effective hygiene education and training for employees and/or students at educational institutions.

- An instant readout display leaves no doubt of any contamination conditions. It also is good for educational/training purposes.



#### Lumitester PD-30 (Product Code: 60486)

|                         |   |
|-------------------------|---|
| Measurement Time        | 10 sec. (20 sec. when using temperature compensation in cold temperatures)                                    |
| Measurement Temperature | 10-40°C when temperature compensation function is ON<br>20-35°C when temperature compensation function is OFF |
| Data Output             | Relative Light Unit (RLU)   |
| Data Memory             | 2000 pcs of data  |
| Power                   | Two AA alkaline or nickel hydride rechargeable batteries  |
| Dimensions              | 65x175x32mm, approx. 235g (excl. batteries)   |
| Accessories             | Two AA alkaline batteries, cleaning brush, USB cable, strap, Quick Manual, CD-ROM, stand-up soft case         |

※Readouts are the same as the older Lumitester models PD-10 (N) and PD-20.  
(When the temperature compensation is off)  
※Do not use this product for purposes other than hygiene monitoring tests.  
※Not to be used for counting general living bacteria or detecting specific pathogens.

#### LuciPac Pen

(Product Code:60331)

100 sticks/kit

#### LuciPac Pen -AQUA

(Product Code:60336)

100 sticks/kit

|         |  |
|---------|--|
| Storage | 2-8°C (should not freeze)<br>14 days at 25°C (when pack has not been opened)<br>5 days at 30°C (when pack has not been opened) |
| Expiry  | 15 months after manufacturing date   |

※Use LuciPac Pen for Lumitester PD-20 or PD-30. Do not use it for other models.

Manufacture and Sales



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