

User Manual

A3 Surface Swabs for A3 System

Code: VLTA-10



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CAUTION!

- **Do not attempt to drink the kit reagent, touch it with bare hands or allow it to splash into eyes.**
- **Please make sure to read the precautions and instructions in this Instruction Manual before attempting to use the kit and exercise extreme caution when using it.**

The ATP+ADP+AMP hygiene monitoring test kit, LuciPac A3 Surface, is a kit for testing cleanliness levels using bioluminescence techniques with firefly luciferase developed with Kikkoman's unique biotechnology.

Applications:

This kit is intended for testing cleanliness levels using a swab test. Please do not use this device for any other purpose than its designed function as a cleanliness level tester. It's important to note that this kit is not suitable for testing or measuring viable bacteria counts or specific types of pathogenic bacteria.

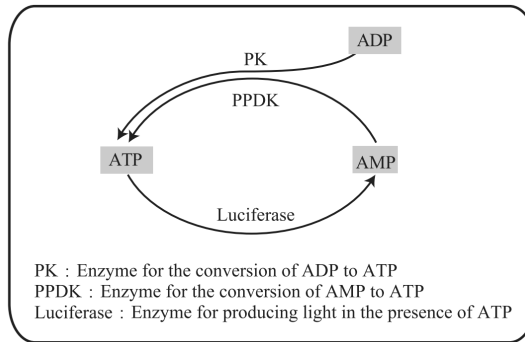
This kit is designed for indicating cleanliness levels in food production centres and medical treatment facilities. It's important to note that the kit does not guarantee that a tested environment is free of bacterial contamination. Additionally, it should not be used for directly testing food or food products.

Measurement Principles:

This kit utilizes an enzyme cycling method that combines luminescent reactions involving firefly luciferase, pyruvate, orthophosphate dikinase (PPDK), and pyruvate kinase (PK). This method generates luminescence proportional to the levels of adenosine triphosphate (ATP), adenosine diphosphate (ADP), and adenosine monophosphate (AMP) present.

ATP serves as an essential energy source for various life forms and can be found in organic residues, including microorganisms, food remnants, and biological substances originating from other living organisms. This ATP monitoring system allows for rapid and highly sensitive detection of organic residues by detecting ATP using luciferase. Consequently, it is widely employed for assessing cleanliness levels in food manufacturing sites and medical treatment facilities.

However, traditional ATP monitoring systems have limitations as they often overlook ADP and AMP generated during ATP degradation. Kikkoman has successfully developed a new ATP + ADP + AMP monitoring system, as depicted in Figure 1. This innovative method enables highly sensitive analyses of a broader spectrum of organic residues.



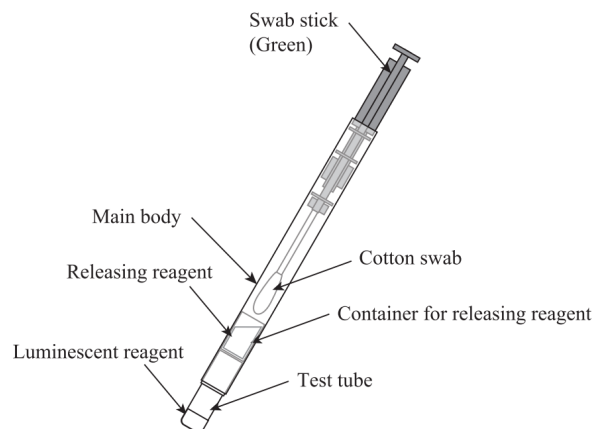
This kit is a simple integrated testing instrument that contains both the test reagent and the swab device required for testing cleanliness levels.

Contents

The LuciPac A3 Surface kit contains five aluminium bags each containing 20 swab devices (for a total of 100 swab devices).

Table 1: Main components of each reagent.

Reagent name	Main components
Luminescent Reagent	Luciferin Luciferase Magnesium acetate Phosphoenolpyruvic acid Pyruvate, orthophosphate dikinase Pyruvate kinase
Releasing reagent	Surfactant (Benzalkonium chloride)



Precautions for Use

To ensure optimal performance from this kit, please adhere to the precautions listed below.

1. **Check Expiry Date:** Do not use products that have passed their expiry date. Expired products may not provide accurate results (the expiry date is printed on the bottom of the aluminium bag containing the swab devices).
2. **Use Designated Products:** Make sure to use only designated products when measuring luminescence levels. This kit should not be used with non-designated products.

3. **Temperature Consideration:** If the swab devices have been stored in a refrigerated environment, allow them to reach room temperature (as specified in Table 2) before testing. Using cold swab devices may result in lower-than-actual measurement values. Use the swab devices promptly once they have returned to room temperature. Avoid exposing the kit to temperatures exceeding 35°C (95°F) as high temperatures may affect product performance."

Table 2: Appropriate measurement temperature

Model	Temperature compensation setting	Temperature range
Lumitester Smart	Off	20 – 35°C
	On*1	10 – 40°C

*1 Temperature compensation is performed in accordance with the measured value of a thermometer incorporated in the main body of Lumitester Smart. Consequently, the compensation cannot be performed precisely if the temperature of the main body of Lumitester Smart is different from LuciPac. Please be sure that temperatures of the main body of Smart and LuciPac become equal before use.

4. **Swab Device Usage:** Whenever possible, use all swab devices from a single opened bag during one testing session. If you need to store unused swab devices, securely close the aluminium bag and store it in a refrigerated environment (2°C to 8°C or 35.6°F to 46.4°F). High temperatures can negatively impact product performance.
5. **Sunlight Exposure:** Avoid prolonged exposure of the kit or its components to direct sunlight. Strong light can reduce product performance.
6. **Handling Precautions:** Refrain from touching any parts inside the sampling devices, especially the cotton swab, with your fingers or any other objects before use. Touching these parts may affect cleanliness level measurements. Do not drop or subject the kit to impacts, as it can damage the inner aluminium sheets and other components, leading to reduced product performance.
7. **Damage Assessment:** Do not use the kit if any parts, such as the inner aluminium sheet, are damaged. Damage can impact product performance, resulting in incorrect cleanliness level measurements. Check for damage by inspecting if the releasing reagent is leaking.
8. **Benchmark Level Setting:** Ensure the benchmark level for required cleanliness levels is correctly established. Incorrect benchmark settings can lead to inaccurate cleanliness evaluations.
9. **Test Tube Security:** Properly secure the LuciPac test tube to prevent shifting or displacement. A shifted tube can cause difficulties in accurately determining cleanliness levels, lead to reagent leakage, hinder removal from the measurement device after testing, and even cause malfunctions in the measurement device.

Measurement Methods:

Measurement Procedures:

Complete the following procedures within the specified temperature range from Table 2, depending on your instrument and temperature compensation setting. Consistently run measurements at the same temperature to ensure repeatability if temperature compensation is not utilized. Before beginning, remove the LuciPac from the refrigerator and let it reach room temperature (refer to Table 2). Use the swab devices promptly once they have returned to room temperature.

Swab Preparation:

- a. Remove the swab stick from the main body (casing).
- b. If testing a dry surface, moisten the cotton swab or the test subject with tap water.
- c. Swab the test subject with consistent pressure, allowing the swab shaft to slightly bend under suitable pressure, as shown in panel 3 on page 8.
- d. Return the swab stick to the main body (casing) and push it all the way in.
- e. Firmly hold the LuciPac casing and shake it.

f. Ensure complete dissolution of any remaining luminescent reagent.

Measurement Process: Insert the LuciPac into the Lumitester to obtain measurement results.

Note: Regular tap water may contain trace amounts of ATP, ADP, and AMP. It is advisable to clean the faucet and let the water run for a while before collecting it for use in such cases. Refer to "Directions for LuciPac" on page 8 for more details.

Handling of Data:

Benchmark levels 1 and 2 are established to determine whether cleanliness levels meet acceptable criteria (refer to Fig. 3). Cleanliness levels are categorized as follows:

- Pass (A): If luminescence falls below level 1.
- Fail (C): If luminescence exceeds level 2. In such cases, cleaning should be redone, and cleaning procedures may need revision.
- Caution (B): If luminescence is above level 1 but below level 2. It is recommended to redo cleaning and revise cleaning procedures in such instances.

Appropriately setting benchmark levels is crucial for determining cleanliness levels in line with specific requirements.

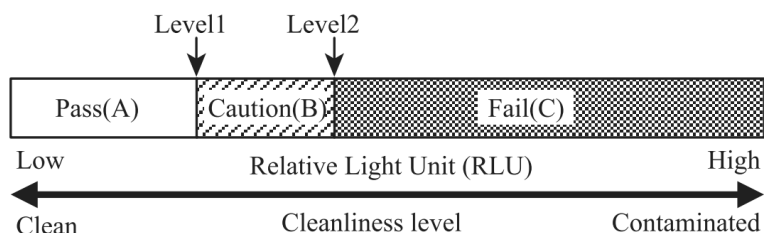


Fig. 3: Setting Benchmark Level for Cleanliness Level Control

Disposal Methods:

This kit does not contain any hazardous materials. Therefore, it can be disposed of as regular garbage. However, for environmentally responsible disposal, it is recommended to separate the kit's components and dispose of each part following local regulations provided by local governments for proper waste disposal.

The main materials and parts used in this kit are listed below, and it's important to note that no PVC materials are used in the production of the plastics in this kit.

Table 3: Main Raw Materials of the Structural Parts of This Product

Structural parts	Raw materials
Swab stick (green part)	Polypropylene
Main body (casing)	Polypropylene
Swab shaft	Polypropylene
Container for releasing reagent	Polypropylene, Aluminium
Measurement tube	Polypropylene, Aluminium
Aluminium bag (with dehumidifying function)	Aluminium, Polyethylene, Polyethylene terephthalate
Outer bag	Polyethylene

Precautions for Handling:

1. **Avoid Contact with Eyes, Mouth, and Skin:** Be cautious to prevent reagents or other kit substances from coming into contact with your eyes, mouth, or bare hands before or after use. If any substances come in contact with your mouth, rinse it thoroughly with water. For skin contact, rinse with ample water, and in case of eye contact, rinse the affected eye thoroughly with a large quantity of water. Seek immediate medical advice and follow any provided instructions.
2. **Storage and Disposal Caution:** Exercise care during the storage and disposal of the kit and its reagents to prevent any substances from mixing with food and other products.
3. **Swab Stick Handling:** When inserting the swab stick into the main body (casing), take care not to catch your fingers.
4. **Keep Out of Reach of Children:** Store this kit and its components out of the reach of young children.
5. **Cationic Surfactants in Releasing Reagent:** Note that the releasing reagent used in this kit contains cationic surfactants, specifically benzalkonium chloride*3. Take special precautions when disposing of the kit after use to ensure that these substances do not mix with food products in food production centres and similar facilities.




*3 Benzalkonium chloride is a disinfectant and antiseptic commonly found in hand and finger sterilizer solutions.




Storage:

1. **Kit Storage:** For long-term storage, keep the kits at a low temperature between 2°C to 8°C (35.6°F to 46.4°F). The kit can also be stored below 25°C (77°F) for up to 14 days or below 30°C (86°F) for up to 5 days before opening an aluminium bag without adversely affecting long-term stability. Avoid freezing the kit.
2. **Swab Device Storage:** It is recommended to use all 20 swab devices from a single bag at once after opening an aluminium bag. If you need to store leftover swab devices after opening a bag, ensure they are stored at the recommended low temperature range (2°C to 8°C or 35.6°F to 46.4°F) and use them within two weeks from when the bag is opened.
3. **Expiry Date:** The expiry date is printed on the aluminium bag for reference.

Warranty:

Klipspringer provides a warranty for the products included in this kit, ensuring a certain level of quality. This warranty covers the replacement of any defective products, should they be identified. Please note that this warranty does not offer any other guarantees. Klipspringer shall not be held responsible for any damages, including special or consequential damages, or expenses resulting directly or indirectly from the use of this product. Symbols Used in the Packaging and Labelling of this product.

Symbols Used in the Packaging and Labelling	
	Symbol for "temperature limitation." The upper and lower temperature limits will be indicated on either side of the symbol. Please store this product at the indicated temperature range.
	Symbol for "Caution" or "Attention" for use.
	Symbol for "Lot Number." This symbol shall be adjacent to the manufacturer's lot number (e.g. 20170410Y) or description of its printed location.

	Symbol for "Use By." This symbol shall be adjacent to the expiration date, expressed as YYYYMMDD (e.g. 20180709), or description of its printed location.
	Symbol for "Manufacturer." This symbol shall be adjacent to the name and address of the manufacturer.
	Symbol for "Consult Instructions Manual."