OSP®
TARGET | TEST | TREAT

LifeCheck®

ATP TEST KIT
HANDBOOK

2023

TABLE OF CONTENTS

LifeCheck®

ATP TEST KIT

OSP®
TARGET | TEST | TREAT

MICROBIAL EXPERTS IN THE OIL AND GAS INDUSTRY

INTRODUCTION

This guide is intended to provide standard procedures that will ensure consistent results.

OSP is continuously improving our ATP Test Kits as ATP technology is optimized, challenged and advanced. Continual improvement means we also adjust our training steps as needed. This does not mean that your testing techniques are wrong, we simply want to apply our new knowledge to ensure that all ATP users are informed to make it as easy as possible to execute their testing. If any of the steps outlined in this guide seem different than your current practice, please contact OSP and we would be happy to answer any questions.

OSP's LifeCheck 2nd Generation ATP Test Kits provide two core methodologies for measuring total microbial concentration via ATP, each tailored to your specific application.

- **Planktonic Kit:** Planktonic is a scientific word for microbes floating in water; this kit applies to any liquid sample.
- **Sessile Kit:** Sessile is a fancy word for immobile; this kit applies to microbes that are attached to hard surfaces including metals, coupons, or within a solid sample. The scientific term for these surface attached microbes is biofilm.

OSP's LifeCheck ATP Test Kits contain all the consumable materials required to run the specified number of tests. OSP is sensitive to the needs of each individual customer. We can supply on-site training services and one-on-one consultation to get your microbial mitigation strategy off the ground. We also offer large group ATP Certification Training Classes. Email us at **lifecheck@ospmicrocheck.com** to schedule the right training for you.

Visit our website www.ospmicrocheck.com or scan the QR code for more ATP information and tools, including:

- ATP Calculation Worksheet
- ATP Online Calculator
- Instructional ATP Video Links
- ATP Equipment Troubleshooting
- ATP Test Kit Reorder Forms
- ATP FAQ's & Glossary

KIT CONTENTS

Your LifeCheck ATP test kit comes with all the necessary equipment to perform on-site testing.

FIELD CASE

SYRINGE
Cat # 1582

LARGE PIPETTOR
(1 mL)
Cat # 1607

TUBE RACKS
- **Large Tube Rack**
  Cat # 1618
- **Small Tube Rack**
  Cat # 1608

BLUE PIPETTOR
(100 µL)
Cat # 1609

REAGENT X (125 mL)
Cat # 1584

REAGENT D
(9 mL TUBE)
Cat # 1587

REAGENT Z + BUFFER
Cat # 1589

FIELD CONTAINER
Cat # 1586

LIFECHECK
PHOTONMASTER
- **Luminometer (left side)**
- **Control Pad (right side)**

Cat # 1620

RINSE REAGENT (250 mL)
Cat # 1595

BULB PIPETTE (DISPOSABLE)
Cat # 1597

ATP STANDARD
Cat # 1588

ASSAY TUBES
Cat # 1590

FILTER
Cat # 1583

SMALL PIPETTE TIP (1 – 200 µL)
Cat # 1591

LARGE PIPETTE TIP (100 µL – 1 mL)
Cat # 1585

REAGENT X (10 mL TUBE)
Cat # 1601

STERILE SWAB(S)
Cat # 1599

SOAK REAGENT (30 mL)
Cat # 1600

ATP KIT STORAGE REQUIREMENTS

For all reagents:

- Recommended storage: 4 to 25°C / 39 to 77°F.
- Refer to expiry date on the label for shelf life.
- Prepared (rehydrated) Reagent Z requires refrigeration between uses, and typically lasts up to 3 months. Always check activity before use, as outlined in the instruction manual, and prepare a new bottle if required.

ATP TEST KIT RESOURCES

ATP KIT SELECTION

OSP provides two core LifeCheck ATP kits, one for liquid samples (planktonic microbial detection), and one for solid or surface samples (sessile microbial detection):

LifeCheck ATP Planktonic Kits (100x tests):

- Planktonic is a scientific word for microbes floating in water.
- This kit applies to most liquid samples.

LifeCheck ATP Sessile Kit (50x tests):

Sessile is a fancy word for immobile. This kit applies to microbes that are attached to hard surfaces, including metals, coupons, or within a solid sample. The scientific term for these surface attached microbes is biofilm. This kit can also be used for viscous fluids that cannot be pushed through a filter.

Within those two groupings, you may encounter challenging fluids that are normal for oil and gas applications. Refer to the chart on page 8 to determine which kit to use and which procedure to follow. If in doubt, contact OSP to tailor a method to suite your needs.

ATP TEST PROCEDURE SELECTION

MY SAMPLE	TEST KIT	PROCEDURE
WATER	Planktonic	A1: Liquid Planktonic Test
MAINLY WATER (production fluids, brine, contains residual hydrocarbons or solids)	Planktonic	A1: Liquid Planktonic Test
MAINLY OIL (sales oil, heavy oil)		
• I can push more than 1 mL through a filter	Planktonic	A1: Liquid Planktonic Test
• I cannot push it through a filter	Sessile	A2: Viscous Fluid Test
VISCOUS FLUID (gelled frac fluid)		
• I can push more than 1 mL through a filter	Planktonic	A1: Liquid Planktonic Test
• I cannot push it through a filter	Sessile	A2: Viscous Fluid Test
PIG RETURNS (a mixture of oil and solids)	Sessile	A4: Solids Soak Test
SCALE OR CORROSION SITE SCRAPINGS	Sessile	A4: Solids Soak Test
CORROSION COUPON		
• It fits into a sample container	Sessile	A4: Solids Soak Test
• It doesn't fit into a container; I need to swab it	Sessile	A3: Solids Swab Test
PIPELINE OR EQUIPMENT FAILURE SITE (pit or surface)	Sessile	A3: Solids Swab Test
GENERAL SOLIDS	Sessile	A4: Solids Soak Test
OTHER WATER BASED FLUIDS	Planktonic	A1: Liquid Planktonic Test

Reminder: If you can use the A1 Fluid Planktonic Test, this is ALWAYS the preferred method. You cannot compare the results from different procedures as the cell density and units are different.

PART A

ATP EXTRACTION PROCEDURES

OSP® TARGET | TEST | TREAT

LifeCheck®

TEST KIT REQUIREMENTS

LARGE PIPETTOR
(1 mL)

REAGENT X
(125 mL)

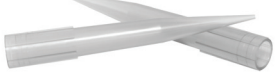
REAGENT D
(9 mL TUBE)

FILTER

SYRINGE

BULB PIPETTE
(DISPOSABLE)

FIELD CONTAINER



LARGE PIPETTE TIP
(100 µL – 1 mL)

RINSE REAGENT
(250 mL)

TEST KIT INSTRUCTIONS

STEP 1

- Wearing gloves, collect sample in the syringe (20-50 mL is recommended).
  - Draw sample into syringe by immersing end in fluid and pulling back on plunger, or:
  - Remove plunger, attach filter, and pour sample into syringe chamber.

STEP 2

- Attach a filter to the syringe and push at least 1 mL of the sample from Step 1 through.
- **Record the volume that you push through the filter in mL as your sample size.**
- If you cannot push through at least 1 mL, use PART A2: Viscous Fluid Test.

QUICK TIPS

- It is important to wear gloves to stop contamination of your sample. Hands have extracellular (outside the cells) ATP and can also have normal human microbes. Using the same reasoning, try not to breath on, sneeze or cough on/in your samples, it will add ATP.
- Draw the sample up into the syringe, or take out the plunger and pour it in. Don't worry about removing the air. Pushing air through the filter will not cause any issues or "dry it out" in the time it takes to complete this test.
- Always try to push through a FULL syringe of fluid. The more fluid, the greater accuracy and less degree of error in the test. The planktonic filter method is the preferred method and should be used if possible.
- Don't push too hard, you don't want to break the filter or have it explode all over you, and you want the fluid to spread out across the filter because this will also spread out the microbes across the filter.
- It is ok to push air through at the end, but don't try and remove it from the syringe, just make sure all your fluid gets through.

STEP 3

- Remove filter.

STEP 4

- Pull plunger out.
- Reattach filter.
- Never pull air/fluid back up through the filter.

QUICK TIPS

- Filters are to be considered a ONE-WAY valve. If you pull air up through them, you unseat the microbes that have been distributed on the surface of the filter back up into the syringe. If that occurs, you can lose some of the ATP, alter the accessibility to the ATP or affect how it reacts with the reagents.
- This is why the filter needs to be removed every time the plunger is pulled out of the syringe, and then reattached for the next step.

STEP 5

- Rinse filter to remove interference.
- Use the disposable bulb pipette to draw up the Rinse Reagent*, filling the bulb as full as possible. (This step doesn't require exact measurement.)

STEP 6

- Squeeze the bulb into the syringe, replace the plunger and push through.
- Push the plunger all the way to the bottom as this is a drying step to remove all of the rinse reagent.
- You can dispose of this fluid.

QUICK TIPS

- This step is about cleaning your filter (and therefore the microbes) to make sure nothing like oil or other contaminants can block your next reagent from working.
- Rinse as many times as it takes for the liquid coming through to run clean. Be sure to remove the filter, pull out plunger, and replace the filter every time you add more Rinse Reagent.

*The rinse reagent is intended to remove interferences like oily residue, suspended solids or water chemistry components that may block reagent contact with the microbes. It is considered a "reagent in excess," meaning exact measurement is not required.

STEP 7

- Remove filter.
- Pull plunger out.
- Reattach filter.

STEP 8

- Use the large pipettor and pipette tip to draw up 1 mL of Reagent X.
- Put into the syringe.

PROPER PIPETTE TECHNIQUES

- Push the pipette into the top of a tip, in the box.
- Don't touch the tips — they are sterile. They should only have contact with the fluids they are measuring.
- Hold the pipette vertical, straight up and down, at all times, never tilt it or position it sideways/horizontal.
- Push the plunger down with your thumb ALL THE WAY TO THE BOTTOM.
- Once depressed, place the tip into the fluid you are measuring, and slowly, smoothly, release your thumb from the plunger.
- Wait a few seconds. It takes a moment to pull the fluid up. Make sure the plunger gets all the way to the top, they can get a bit sticky depending on how well they are looked after.
- Once it is full, pull it out and move it over to the container you are releasing it into. KEEP IT VERTICAL. It won't leak out.
- Place it below the edge of the container. Don't hover above.
- Depress the plunger ALL THE WAY to the bottom again. Feel free to give it an extra push or shake.
- DISPOSE OF TIP and NEVER RE-USE. Get a new one for the next step.

STEP 9

RECOMMENDED LAB OPTION:

- Replace the plunger and push Reagent X directly into the Reagent D tube.
- This can now be stored in a cool environment for up to 7 days before completing the testing.
- **This fluid mixture is your Sample Extract used in PART B.**

RECOMMENDED FIELD OPTION:

- Replace plunger and push Reagent X into a field container.
- This can now be stored in a cool environment for up to 7 days before completing the testing.
- When ready to test, simply add the entire contents of a Reagent D tube into the field container, mix gently and continue testing.
- **This fluid mixture is your Sample Extract used in PART B.**

QUICK TIPS

- Reagent X is a lysing agent. To lyse simply means you are cutting the cell open. When you add the lysing reagent you are cutting open all the cells trapped on the filter and releasing the ATP, which then passes through into the Reagent D tube or Field Container.
- The Reagent D dilutes and stabilizes the ATP mixture you just pushed through the filter, so it's ready for your next step of reading how much ATP is there.

View our library of instructional videos

Your sample preparation is now complete and you have obtained your Sample Extract.

Proceed to PART B: Sample Reading to conduct final readings using the LifeCheck PhotonMaster.

TEST KIT REQUIREMENTS

This procedure is used for fluids that won't easily pass through the filter in Part A1: Liquid Planktonic Test procedure. Heavy oil or sales oil, crosslinked fracturing fluids or highly contaminated water samples can be tested using this method. Please refer to the Calculation Notes in Part C on how to properly calculate results based on water content.

LARGE PIPETTOR (1 mL)

REAGENT X (10 mL TUBE)

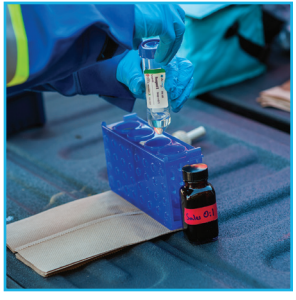
REAGENT D (9 mL TUBE)

LARGE PIPETTE TIP (100 µL – 1 mL)

TEST KIT INSTRUCTIONS

STEP 1

- Wearing gloves, measure volume of fluid for testing.
- Record this measurement for your calculations.
- **This is your Sample Size.**



STEP 2

- Transfer your sample into a Reagent X tube.
- For oil samples, roll the tube as the oil will adhere to the sides and allow for better contact with the reagent fluid.

STEP 3

- Soak fully immersed for at least 10 minutes.
- This can now be stored in a cool environment for up to 7 days before completing the testing.

STEP 4

- Use the 1 mL large pipettor and pipette tip to transfer fluid from the bottom of the Reagent X tube into a Reagent D tube. Gently mix.
- **This fluid mixture is your Sample Extract used in PART B.**

Your sample preparation is now complete and you have obtained your Sample Extract.

Proceed to PART B: Sample Reading to conduct final readings using the LifeCheck PhotonMaster.

For more information, scan the QR code below for detailed instructional videos.

View our library of instructional videos

TEST KIT REQUIREMENTS

Follow appropriate sample handling procedures to conduct sample prep on site as soon as the surface is exposed.

LARGE PIPETTOR (1 mL)

REAGENT X (10 mL TUBE)

REAGENT D (9 mL TUBE)

LARGE PIPETTE TIP (100 µL – 1 mL)

STERILE SWAB(S)

SOAK REAGENT (30 mL)

TEST KIT INSTRUCTIONS

STEP 1

- Wearing gloves, determine the area to be swabbed being careful not to contact the surface with your hands.
- If available, use the swab square provided in the kit, and swab within the cut out. If the area is large, swab the desired zone and measure after. A 1 inch square or 1 corrosion feature is the typical area to be swabbed.
- Record this area measurement for your calculations in cm^2 or in^2.
- **This is your Sample Size.**

STEP 2

- Open the sterile swab and dip into the Soak Reagent.
- Swipe the desired surface area moving up and down, and side to side once in both directions, to ensure full coverage of the area.
- Understand that a consistent procedure is required to compare with subsequent sample data. (Be consistent with parameters like swab pressure, surface area, sample size etc.).

NOTE:

- Do not dip the same swab in the Soak Reagent.
- No double dipping.

STEP 3

- Break the swab close to the tip so remaining length and tip fits into the Reagent X tube.
- Open a 10 mL Reagent X tube and insert the swab.

STEP 4

- Soak fully immersed for at least 10 minutes.
- This can now be stored in a cool environment for up to 7 days before completing the testing.
- Close the Reagent X tube with swab inside.

STEP 5

- Use the 1 mL large pipettor and pipette tip to transfer 1 mL of fluid from the Reagent X tube into a Reagent D tube. Gently mix.
- **This fluid mixture is your Sample Extract used in PART B.**

Your sample preparation is now complete and you have obtained your Sample Extract.

Proceed to PART B: Sample Reading to conduct final readings using the LifeCheck PhotonMaster.

View our library of instructional videos

TEST KIT REQUIREMENTS

This method is ideal for coupons, scale samples, scrapings, pig returns or other solid samples.

LARGE PIPETTOR (1 mL)

REAGENT X (10 mL TUBE)

REAGENT D (9 mL TUBE)

LARGE PIPETTE TIP (100 µL – 1 mL)

TEST KIT INSTRUCTIONS

STEP 1

- Following appropriate sample handling procedures, measure your sample either by weight or surface area.
- Record this measurement for your calculations (g, mg, cm^2, in^2).
- **This is your Sample Size.**

STEP 2

- Transfer your sample into a Reagent X tube.
- If the coupon is too large for the 10 mL Reagent X tube, use an appropriately sized sterile container and pour Reagent X contents in.
- If more than 10 mL of Reagent X is required to cover the solid sample, add another tube volume and record this total Reagent X volume for your calculations.

STEP 3

- Soak fully immersed for at least 10 minutes. This can now be stored in a cool environment for up to 7 days before completing the testing.

Your sample preparation is now complete and you have obtained your Sample Extract.

Proceed to PART B: Sample Reading to conduct final readings using the LifeCheck PhotonMaster.

For more information, scan the QR code below for detailed instructional videos.

STEP 4

- Use the 1 mL large pipettor and pipette tip to transfer fluid from the Reagent X tube into a Reagent D tube. Gently mix.
- **This fluid mixture is your Sample Extract used in PART B.**

View our library of instructional videos

PART B

SAMPLE READING

TEST KIT REQUIREMENTS

ASSAY TUBES

BLUE PIPETTOR (100 µL)

REAGENT Z + BUFFER

SMALL TUBE RACK

ATP STANDARD

SMALL PIPETTE TIP (1-200 µL)

LIFECHECK PHOTONMASTER

- **Luminometer (left side)**
- **Control Pad (right side)**

TEST KIT INSTRUCTIONS

REAGENT Z PREP

PREPARING THE REAGENT Z AND TESTING ENZYME ACTIVITY:

In preparation for your ATP reading, add the liquid buffer in the clear vial to the freeze-dried Reagent Z in the brown vial. You can toss the little rubber stopper that previously sealed the freeze-dried reagent — only the plastic cap is necessary now. You can also toss the clear liquid buffer container now that it's empty. Shake and let stand for 5 minutes to fully hydrate.

Measure the Reagent Z activity (sRLU) once per sample batch, or when a new bottle of Reagent Z is resuspended with buffer.

View our library of instructional videos

QUICK TIPS

- The Reagent Z Testing Enzyme comes in your kit as a freeze-dried portion (brown bottle) and a liquid buffer (clear bottle). Keep these in the fridge or freezer until you are ready to use them, then let them sit out in room temperature to thaw. Once liquid, mix both in the brown bottle, and be sure it is at room temperature before you use it. This can take 10 or 15 minutes.
- If you miss a droplet or have shaky hands and spill a little bit, it is ok. The Standard Reading (sRLU) will accommodate for these small nuances.
- Enzymes can be easily damaged by heat. Store it in the fridge after mixing, and don't leave it in the sun. The sun and heat will degrade it very quickly.
- We test the activity of the enzyme using a standard and use that activity level in our calculations. If your standard reading is below 5000 RLU it is too low and needs to be thrown out. Mix a new bottle and start again.
- Test your enzyme activity at the beginning of a sample batch, or when you open a new bottle. You don't need to run this before every test. Use the same value for all of your calculations.
- There are about 30 tests per mixed bottle.

STEP 1

- Turn on the LifeCheck PhotonMaster. Press yellow button to turn on.
- Choose “Measure RLU” by pressing the green button, choose “Quick Mode” by pressing the green button. You are ready for reading.

STEP 2

- Place an empty assay tube in the PhotonMaster Luminometer and hit the green button on the Control Pad to take a reading.
- **Record this value as your bRLU.**
- This measurement should be below 50 RLU.

QUICK TIPS

- Assay tubes can add background light (RLU) and this needs to be accounted for to ensure accurate ATP results.
- If your tubes are cracked, scratched, dirty or have been sitting in direct sunlight, they can have high background readings. If this is above 50 RLU, throw them out!
- If you have over-handled the tube, it can pick up static electricity and give you a high reading. Ground yourself, get a new tube and try again.
- If you test your tube and it is below 50 RLU, and it is in the same condition and from the same bag as your remaining tests, you can use this value for your remaining calculations. No need to test EVERY tube.
- Treat your packs of tubes with care!

STEP 3

- Use the 100 µL blue pipettor and pipette tip to add Reagent Z to one of the assay tubes. If you haven't re-hydrated your Reagent Z yet, refer to the beginning of this procedure before continuing.

STEP 4

- Add 2 drops of the ATP Standard. Gently tap assay tube to mix, then place in the LifeCheck PhotonMaster and hit the green button to take a reading.
- **Record this value as your sRLU.**
- *If this reading is below 5000 RLU you need to replace your Reagent Z.

QUICK TIPS

- The Standard Reading is used to ensure the enzyme is still active and that the activity is at a level to ensure accurate results. Enzymes will naturally degrade over time, even with proper handling.
- This value ensures that final calculations accommodate for changes in the Reagent Z, and the integrity of the results are preserved.
- If you keep the enzyme in the fridge between testing, and it isn't exposed often or for long periods of time to heat and sun, it can last for months.
- Tapping the assay tube ensures any droplets that may have adhered to the side of the tube, drop down into the bulk fluid at the bottom.

Proceed to PART B2: Sample Reading to conduct final readings using the LifeCheck PhotonMaster.

Instructional Videos for this procedure are available on YouTube via the OSP website www.ospmicrocheck.com.

For more information, scan the QR code below for detailed instructional videos.

View our library of instructional videos

Use our online ATP calculator

TEST KIT REQUIREMENTS

This procedure requires the Sample Extract from PART A, and your sRLU and bRLU readings from PART B1.

ASSAY TUBES

BLUE PIPETTOR (100 µL)

SMALL PIPETTE TIP (1-200 µL)

LIFECHECK PHOTONMASTER

- **Luminometer (left side)**
- **Control Pad (right side)**

Use the ATP Worksheet (available on the website) to record this value: Sample RLU. This procedure requires the Sample Extract from Part A, and your sRLU and bRLU reading from B1.

STEP 1

- Use the blue pipettor (100 µL) and a NEW pipette tip to add your Sample Extract to the NEW assay tube. Discard the pipette tip.
- **Remember your pipette etiquette (page 14)! NEVER re-use assay tubes!**

STEP 2

- Use the blue pipettor (100 µL) and a NEW pipette tip to add Reagent Z to the assay tube used in Step One. Discard the pipette tip.
- **Remember your pipette etiquette (page 14)! NEVER re-use a pipette tip!**

STEP 3

- Gently tap the assay tube to mix, then place in the PhotonMaster Luminometer.
- Tapping the assay tube ensures any droplets that may have adhered to the side of the tube, drop down into the bulk fluid at the bottom.
- **Don't let this assay tube sit once you have combined the two fluids. You have created a chemical reaction, and it needs to be tested immediately.**

STEP 4

- Hit the green button on the Control Pad to take a reading.
- **This value is your Sample RLU.**
- Proceed to Part C to count the number of microbes in your sample.

Proceed to PART C: Calculate Microbial Equivalents to determine final microbial counts in your sample.

Instructional Videos for this procedure are available on YouTube via the OSP website www.ospmicrocheck.com.

For more information, scan the QR code below for detailed instructional videos.

View our library of instructional videos

Use our online ATP calculator

PART C

CALCULATE MICROBIAL EQUIVALENTS

Use ATP Trending Worksheet provided by OSP

WHAT YOU WILL NEED

The following formulas calculate the mass of ATP per unit of measurement. This value is then converted to a microbial count (ME/unit) using a factor of 1000 to provide a Microbial Equivalent (ME) of active/living microbes.

The multiplication factor used is based on the amount of ATP found in an *E. coli* microbe, which has determined to be a valid proxy for comparing to the mixed microbial communities evaluated in our industry.

ME provides a universal unit, directly comparable to the results of other common microbe quantification assays such as bug bottles (serial dilution log growth), CFU counts, microscopy counts and qPCR.

PART A1: LIQUID PLANKTONIC TEST

$$\frac{\text{Sample RLU} - \text{bRLU}}{\text{sRLU} - \text{bRLU}} \times \frac{10{,}000}{\text{Sample Size (mL)}} = \text{pg of ATP/mL}$$

$$\text{pg of ATP/mL} \times 1000 = \text{ME/mL}$$

PART A2: VISCOUS FLUID TEST

$$\frac{((\text{Sample RLU} \times \text{Sample Size}) - \text{bRLU})}{\text{sRLU}} \times \frac{100{,}000}{\text{Sample Size (mL)*}} = \text{pg of ATP/mL}$$

$$\text{pg of ATP/(mL)} \times 1000 = \text{ME/mL}$$

*The sample size recorded is of the total volume of viscous fluid being tested. Since microbes can only survive in the water fraction of these samples, the results can be further refined to allow for accurate comparison of subsequent samples, and proper evaluation of contamination level.

Report per mL of total water in the sample, rather than total fluid volume including hydrocarbons.

PART A3 & A4: SOLID SWAB & SOLID SOAK TESTS

$$\frac{\text{Sample RLU} - \text{bRLU}}{\text{sRLU} - \text{bRLU}} \times \frac{10{,}000 \times \text{Reagent X Volume}}{\text{Sample Size (g, mg, cm}^2\text{ or in}^2\text{)}} = \text{pg of ATP/mL}$$

$$\text{pg of ATP/(unit)} \times 1000 = \text{ME/mL}$$

Note: Reagent X volume in the above calculations is 10 mL, unless otherwise adjusted during the extraction process.

OPERATING THE PHOTONMASTER

The LifeCheck PhotonMaster is a sensitive laboratory device and while designed for field use, should be handled with care. **Avoid operating the unit in excessive high or low temperatures, avoid operation in direct sunlight, and avoid exposure to physical shock.**

We recommend storing your LifeCheck PhotonMaster in its supplied field case when not in a lab setting, especially during transportation.

POWER		**1.** Press once to turn POWER ON. **2.** Press and hold 3 sec to turn POWER OFF. *The LifeCheck PhotonMaster will not power off if you have left an assay tube in the chamber.
NAVIGATE DOWN		**1.** Press once to scroll DOWN next item in the menu list. **2.** Press and hold to advance quickly through menu list.
NAVIGATE UP		**1.** Press once to scroll UP next item in the menu list. **2.** Press and hold to advance quickly through the menu list.
SELECT		**1.** Press once to SELECT items in the menu list.
MENU/ CANCEL		**1.** Press once to return to MAIN MENU. **2.** Press during reading to CANCEL.
BATTERY CHARGE INDICATOR		**1.** Red LED Off — Device is off. **2.** Red LED Flashing — Battery level is low. **3.** Red LED On — PBM is turned on. *Remember to keep charged up!

The LifeCheck PhotonMaster uses an integrated high capacity Li-ion battery delivering enough power to perform more than 1000 readings. When the LifeCheck PhotonMaster is in standby mode (turned off) it draws a small current to maintain operational functionality, which over time will deplete the battery. The PhotonMaster can be charged from most common USB wall chargers or from a USB port on a computer. A full charge will take approximately 6 hours to complete based on a maximum 500mA power supply (commonly found on phone chargers).

Connect the Micro USB to USB cable (supplied) to the LifeCheck PhotonMaster port labelled 'PC', connect the opposite end of the cable to the appropriate charger. When charging a LifeCheck PhotonMaster with a completely depleted battery, a short time is required to allow sufficient charge before the LifeCheck PhotonMaster can be powered on. With the LifeCheck PhotonMaster powered ON and charging, the red battery indicator light will illuminate to notify the user that the unit is being charged. Please note that the 'AUTO POWER OFF' function will activate after 20 minutes of inactivity, which includes the battery indicator light, however the battery will continue to charge. The battery is fully charged when the battery indicator light does not illuminate with the LifeCheck PhotonMaster turned ON.

ISSUE	RECOMMENDATION
Unit was exposed to extreme temperatures (below 5 °C (41°F) or above 35°C (95°F))	Allow unit to come to room temperature and reattempt protocol.
Control Pad is not turning on	Plug unit into a wall outlet using a standard USB charger that does not exceed 5V output for a minimum of 30 minutes.
Unit is plugged in and lights are illuminated, but the Control Pad remains unresponsive	The unit is insufficiently charged. Plug in and leave to charge overnight.
Control Pad display screen is frozen	Allow battery to fully run out, then recharge and turn on again.
Are readings lower than expected values?	Ensure reagents are not expired (expiry information can be found on reagent vials). Ensure reagents are being stored properly (storage information can be found on reagent vials). There may be light leakage in the assay chamber. Ensure lid closes properly and no debris is blocking the lid from closing.
Are readings higher than expected values?	There may be light leakage in the assay chamber. Ensure lid closes properly and no debris is blocking the lid from closing.

EQUIPMENT HANDLING

1. Keep all equipment out of direct sunlight and protect it from high wind, dust and freezing cold temperatures.
2. Maintain the cleanliness of your equipment.
3. Ground yourself before using the equipment.

ASSAY TUBES

1. As with all your ATP test kit reagents and plastics, treat your assay tubes with care (mistreatment can lead to cracks and scratches).
2. Visually inspect assay tubes prior to use and avoid using any cracked or scratched tubes as visible imperfections may interfere with light detection in the ATP reaction.
3. Keep the assay tubes in a dark space away from direct sunlight as they can absorb light which does effect results within the PhotonMaster.

PIPETTOR ETIQUETTE

1. Always handle your pipettor in the upright position. Holding it upside down may result in fluid entering the piston of the pipettor causing contamination between samples and/or incorrect volumes to be pipetted.
2. Bubbles in the pipetted volume (in the tip) are an indication that less than the desired volume was drawn, and are often a result of releasing the plunger too rapidly, or there was insufficient volume in the container from which the solution was sourced or the pipette tip is not properly attached to the pipettor.

PIPETTE TECHNIQUES

1. Firmly attach the appropriate NEW tip to the pipettor by gently tapping the bottom of the pipettor into the top of the tip, remove tip from box (attached to pipettor).
2. Using a thumb or index finger, plunge the pipettor plunger downwards to its full stop position, then carefully place tip into the solution to be pipetted (sucked in) while still holding the plunger down.
3. Slowly, and smoothly release the plunger, and the appropriate volume will be drawn into the tip. Watch for bubbles that may be present in the fluid drawn.
4. Holding the pipettor in the upright position, move pipettor/tip assembly to the desired tube and press the plunger to its full stop position to expel all of the fluid from the tip.
5. Remove the used tip and dispose. Do not re-use pipette tips.

ATP SURFACE SWAB MEASURE SQUARE

Remove centre square along perforation to create a 1 inch square swab area.

Swab within centre cut out

"Where there is water, there are microbes. Where there are microbes, OSP can help."

~ MARC DEMETER,
Chief Science Officer

ADDITIONAL RESOURCES

SUPPORT FOR ALL YOUR MICROBIAL NEEDS

OSP is sensitive to the needs of the oil and gas industry — and each individual customer. If you are challenged with any type of microbial testing, ATP or otherwise, please connect with our experts. We have multiple solutions available including, DNA level testing technologies, and biocide selection testing services. Additional services include:

- on-site training services
- one-on-one consultation
- microbial mitigation strategy and implementation of ATP certification training classes
- general oilfield microbiology training as requested

Email us at **lifecheck@ospmicrocheck.com** to schedule the right training for you and your team. For re-ordering of ATP Test Kit Supplies, visit our website and fill out an order form, or connect with a local office to place your order.

Visit our website www.ospmicrocheck.com or scan the QR code for more ATP information and tools, including:

- ATP Calculation Worksheet
- ATP Online Calculator
- Instructional ATP Video Links
- ATP Equipment Troubleshooting
- ATP Test Kit Reorder Forms
- ATP FAQ's & Glossary

STAY CONNECTED

CALGARY
#6, 820 28 St NE Calgary, AB
T2A 6R3
+1 403-291-1658

HOUSTON
16223 Park Row, Suite 190 Houston, TX
77084
+1 281-497-2692

ospmicrocheck.com

OSP®
TARGET | TEST | TREAT

LifeCheck®