SwabTek
Veriteque USA, Inc.

LIQUID EXPLOSIVES TEST KIT (LETK/LTD)

User Manual

Document · LETK/LTD-MANUAL
Version · 1.1

CONTENTS

LETK/LTD - MANUAL

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Liability Notice & Terms of Use

Notice to Users
Veriteque USA Inc. (SwabTek) field tests are presumptive only and, as such, they indicate the presumed presence of chemical groups and precursors which may be present in a given sample. ALL SWABTEK TEST RESULTS SHOULD BE CONFIRMED BY AN APPROVED ANALYTICAL LABORATORY. All SwabTek tests must be administered in strict accordance with the specific instruction and reference materials that accompany the products for best results.

Veriteque USA, Inc. cannot anticipate all conditions for use of this product and cannot accept responsibility for use or misuse in any particular application. This product has been designed for a variety of applications, under a variety of conditions, but was neither designed nor manufactured as a product for lethal or harmful purposes. Veriteque USA, Inc. recommends the user exercise their judgement to determine product suitability for any specific use-case, and application of the tests' presumptive analysis for their particular purposes. Use of this product for unlawful purposes is expressly prohibited under the terms and conditions of its use.

Warranty
If you believe your product has any defects in materials or workmanship, cease use immediately and contact Veriteque USA, Inc. for a remedy. If a product proves to be defective in materials or workmanship, we will repair or replace the defective product and send it to you at our expense.

The information in Veriteque USA, Inc's reference materials is believed to be accurate and represents the best information currently available to the manufacturer. However, the company makes no warranty of merchantability or any other warranty, express or implied, with respect to such information, its correctness or accuracy. Veriteque USA, Inc. employees' or representatives' ORAL OR OTHER WRITTEN STATEMENTS DO NOT CONSTITUTE WARRANTIES and shall not be relied upon by buyer.

Limitation of Liability
IN NO EVENT SHALL VERITEQUE USA, INC. BE LIABLE FOR ANY PUNITIVE, EXEMPLARY OR CONSEQUENTIAL DAMAGES, ANTICIPATED OR LOST PROFITS, INCIDENTAL DAMAGES, LOSS OF TIME, OR OTHER INDIRECT LOSSES OR EXPENSES THAT ARISE FROM ANY CAUSE RELATING TO OR ARISING FROM THE USE OR MISUSE OF THE PRODUCT, REGARDLESS OF THE FORM OF THE ACTION, WHETHER IN TORT (INCLUDING NEGLIGENCE), CONTRACT, STRICT LIABILITY OR OTHERWISE, AND REGARDLESS OF WHETHER THE COMPANY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Procedure
If SwabTek's test swabs are used to collect a sample from a consumable good — i.e. plant material, cookies, gummies, candies, etc. — said item should NOT be consumed, regardless of outcome of the test, and should be disposed of in accordance with local regulation. If SwabTek's test swabs are used to collect a sample from a reusable product that users come into direct contact with — i.e. vape pens, pipes, bongs, etc. — said items should be cleaned thoroughly with soap and wiped dry prior to use.

SwabTek Test Kit Certification

SwabTek test kits meet or exceed the testing standards established bu:

National Institute of Justice

Standards Council of Canada

United Kingdom Home Office Scientific Development Branch

European Civil Aviation Conference

SwabTek's tests are validated against these standards by third-party testing authorities. Independently prepared reports from this third-party testing are available upon request.

As presumptive color tests, SwabTek Test Kits are classified as a Category C analytical technique for analysis of seized drugs under the guidelines outlined by SWGDRUG. As Category C forensics tools, SwabTek's tests are admissible in court for determining selectivity through General/Class chemical identification.

SwabTek Kit	Relevant Standard	Testing Authority
Dry Explosives Test Kit	ASTM E2677-20 SCC	UK-HOSDB UK-MPS DfT
Liquid Explosives Test Kit	ECAC SCC	Armasuisse
Narcotics Test Kits: Amphetamine, Cannabis, Cocaine, Fentanyl, Heroin, Nicotine+	ASTM E2329–17 ASTM E2548–16 ASTM E2882–19 NIJ Standard–0604.01 SWGDRUG SCC	MRI Global

LETK/LTD | Test Background

Veriteque USA, Inc.'s SwabTek Explosives Test Kits are a simple, intuitive identification test that can be used to screen for various types of explosive materials, pre-cursors, and residuals. The Liquid Explosives Test Kit (LETK) is a single use, dry reagent-based spot test that is specifically designed to test for explosives substances in liquids, aerosols, gels and creams. Some of the LETK tests are also branded as Liquid Threat Detect Tests (LTD), which is the same test under a different name.

The test consists of two separate pieces, a test swab and a test strip, that come individually sealed in air- and water-proof sachets. With just a single swab and test strip, the user can conduct the three separate stages of the Liquid Explosives Test to screen for a variety of potential explosives indicators.

The test stages are as follows:
- Test Stage 1: Peroxides
- Test Stage 2: Solvents & Fuels
- Test Stage 3: Acids & Bases

Unlike the industry standard tests that are dangerous and overly complex, the LETK test does not require any hazardous liquid chemicals, dropper bottles, or pressurized spray cans. The test also avoids procedures like breaking glass ampoules, or scooping, mixing and pouring samples.

Since the LETKs are lightweight, durable, and non-hazardous, they can easily be stored in wallets, pockets, or glove compartments for easy access and use on the go.

The latest version of Veriteque USA's LETK has been approved by the European Civil Aviation Conference (ECAC) as a Liquid Explosive Detection System to the Level 3 Standard. This is searchable in ECAC records under the designation "SwabTek LETK" using the latest LETK's Detection Hardware number of BL 315250.

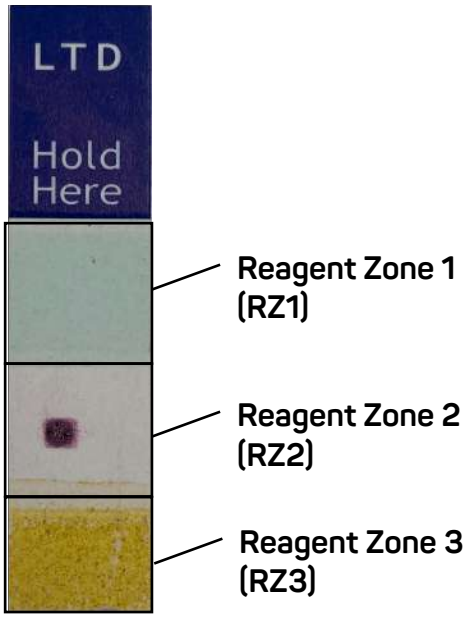
LETK/LTD | Test Strip

The LETK test strip is a paper strip with three dry test zones printed onto the surface. These zones contain the reagents necessary to conduct the three different stages of the screening process. When combined with the sample from a test swab, the reagents in these zones will be responsible for the color changes that will indicate the presumed presence of certain groups of explosives materials.

Each test strip is delivered individually in a single, sealed sachet that protects the test zone from exposure to air, water, and other possible contaminants. The sealed sachet is printed with descriptive information about the test strip, including the particular narcotic that the test is designed for, the Best if Used by Date, and the end of the sachet that should be torn open to extract the test strip.

The test strip itself is a 2" x 0.5" strip of reinforced paper, with three approximately 0.5" x 0.5" reagent zones on the lower two thirds. The three individual reagent zones can be identified by the three colored powder sections that are printed onto the white section of the strip.
1. The first reagent zone (RZ1) should be a solid rectangle that is light blue in color
2. The second reagent zone (RZ2) is indicated by a small dark purple square
3. The third reagent zone (RZ3) is indicated by a grainy yellow square at the base of the strip

Since the reagents are printed onto the test zone in a powder form, they may be inadvertently removed from the paper strip by physical abrasion or rubbing or contaminated by contact with another object. To avoid abrasion or contamination, the test strip should only be held by the top end, which is labelled with the name of the test kit, and a message indicating to "Hold Here".



LETK/LTD | Test Swab

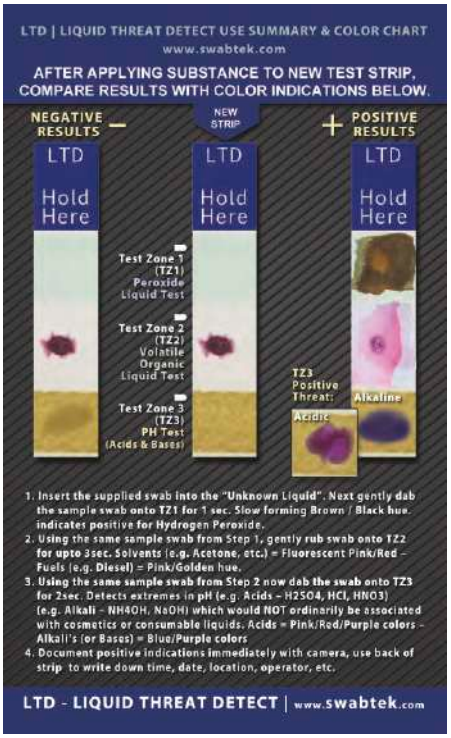
The LETK test swab is provided to help isolate and collect suspect liquids, gels, aerosols, and creams and to transfer samples to the test strip's reagent zones for analysis. The tip of the LETK swab should be dry and clean, allowing for easy absorption of the substance in question.

The test swabs are delivered individually in a single, sealed sachet that protects it from exposure, ensuring that the tip of the swab is clean, untainted, and ready for testing. The sachet is printed with information about the swab, including the test's name, and the end that should be opened to extract the swab.

LETK/LTD | Reference Card

All LETK tests should be used in conjunction with an LETK reference card that is distributed to accompany each test. The LETK reference cards will provide a quick summary of the three-stage testing procedure required for the screening and will provide a color guide as a reference-point for the color reactions indicative of positive and negative test results for each of the stages.

SwabTek advises that the LETK reference card be reviewed in advance of conducting a test in the field and should always be used to accompany the analysis of test outcomes. Although the reference card gives a reasonable summary of the testing procedure, it is not a sufficient replacement for this manual, and should not be used as the primary reference material in training for use of the product.



LETK/LTD | General Testing Process

When residue containing a detectable explosives substance is transferred to, and mixed with, one of the three reagent zones, the presumptive identification of the corresponding group of explosives is indicated by an intense and rapid color change in the reagent. Depending on the nature of the sample, this color change may occur on the swab, on the reagent zones of the strip, or on both surfaces. For this reason, it is essential that the user check both the swab and strip for indication of color change at each stage in the test.

The color change of a positive result should be very rapid and permanent, and though the color may vary in intensity and hue due to the potential varied nature of sample compounds, it should contain the primary color expected of a positive result. The development of this primary color indicates a positive result for the presumed presence of the particular group of explosives in question in the sample. For example, the primary color indicative of a positive result for the first reagent zone on the LETK strip is BROWN. Any indication of the development of the color brown suggests a positive test result, even if the color that develops varies in hue and intensity from the examples provided in SwabTek's product resources.

When conducting the test, the user will use the same sample swab and follow the three stages of the testing procedure in order. For the LETK, the three reagent zones (RZ1, RZ2, RZ3) correspond with the three stages in the testing procedure (Test 1, Test 2, Test 3).

NOTE: A positive result in any of the individual test stages (Test 1, Test 2, Test 3) is sufficient indication of the presumptive presence of explosives or explosive precursors and is therefore a positive result for the entire LETK. If a positive result is identified prior to the final stage of testing, the user need not complete the remaining stages, and can consider the overall result a positive test.

Following the testing procedure, it is recommended that users take photographic record of the test result, both the LETK strip and LETK swab, as well as the sample itself, and note the date, time, and conditions of the test (location, lighting, temperature, etc.). Although the color change present in a positive test result is permanent, the hue and intensity of the color may change over time with continued exposure to air, even if the test components are sealed, so a test result that is more than a few minutes old can no longer be considered valid for visual analysis. If a proper reading or a well-lit and color-balanced photograph is not captured in this timeframe, the user may be required to re-do the test.

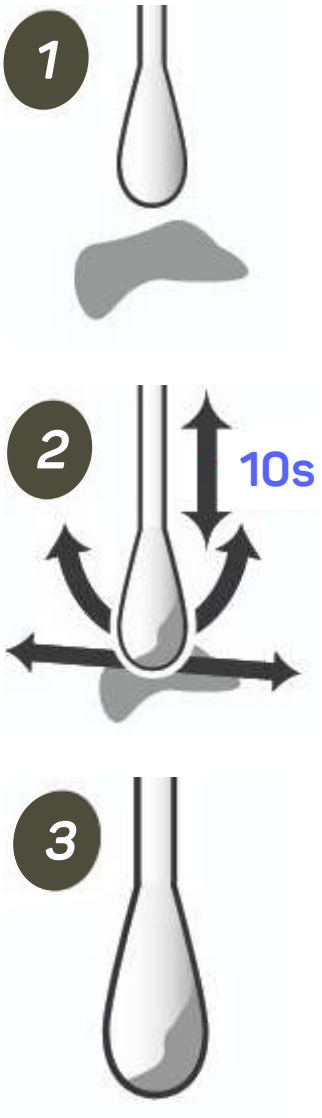
Following the completion of this procedure, the LETK strip, LETK swab, and sample in question should be sealed in separate, secure, dry and air-tight storage if required for evidence. Otherwise, the test can be disposed of via recycling, or in accordance with local waste regulations. The LETK strip and LETK swab do not contain any dangerous or hazardous materials, and do not require any special disposal procedures (acid neutralization, HAZMAT disposal, etc.)

LETK/LTD | Sample Collection Instructions

Once the user has identified the suspect substance, the first step of the test is to gather the sample. The user should open the LETK swab sachet from the correct end and withdraw the swab from the packaging. The swab should be held perpendicular to the liquid test substance to ensure that the sample collection is concentrated on the tip. The user should then dab on and around the sample for a minimum of 10 seconds.

The swab should be dabbed with enough pressure that the liquid test substance is collected or absorbed into the tip of the swab, but not so vigorously that the substance is disturbed or that the sample is pressed off of the swab's tip. The user should aim to collect as much liquid test substance as possible directly on the tip of the swab and avoid tilting or swiping the swab across the test surface. A more highly concentrated sample collection will help to ensure that any potential positive results in the subsequent test stages will create strong and definitive color changes. If the liquid test substance is visible to the naked eye, the user may inspect the tip of the swab to ensure that the substance is being collected properly, ensuring to keep a safe distance.

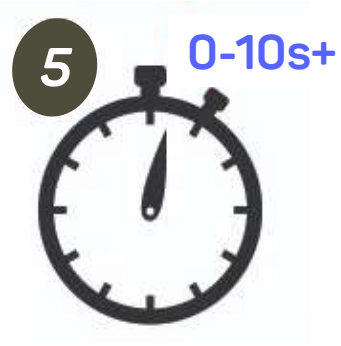
Once a reasonable amount of test substance has been collected, the user should proceed immediately to the next phase of the testing procedure.



LETK/LTD | Testing Procedure

Preparation:
Directly following sample collection, the user should begin the Test Stages.
The user should start by removing the LETK strip from its sachet by tearing the appropriate end of the packet and withdrawing the strip by the correct end.
The user should then stabilize the strip against a firm surface (tabletop, counter, notebook, palm of gloved hand, etc.) to prepare for testing.

Test Stage 1:
The user should take the LETK swab with the collected sample (see LETK | Sample Collection Instructions) and press firmly down against the LETK strip's first dry reagent zone – RZ1 (see LETK | Strip). The LETK swab should be pressed down perpendicularly to the LETK strip and held for 2 seconds. The user should then withdraw the LETK swab from the LETK strip and prepare to analyze the results.



The user can refer to the "Test Stage 1 – Peroxides" section of this manual (page 13) for a full breakdown of the color and chemical analysis for this stage.

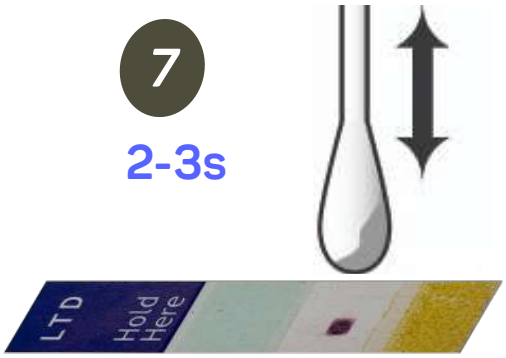
If a positive result develops for this Test Stage, the user can consider the entire test result to be positive, and the user need not continue. If a positive result does not develop within 10 seconds, the Test Stage has provided a negative result, and the user can proceed onto Test Stage 2.

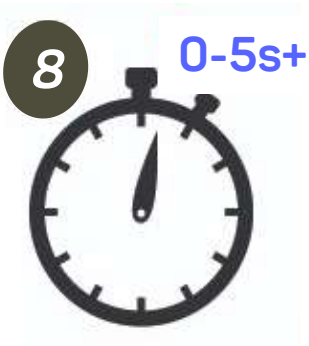
LETK/LTD | Testing Procedure

Test Stage 2:
The user should take the same LETK swab from Test Stage 1 and press firmly down against the LETK strip's second dry reagent zone – RZ2 (see LETK | Strip). The LETK swab should be pressed down perpendicularly to the LETK strip. The user should continue to dab around the reagent test zone for another 2-3 seconds to ensure that the sample has ample opportunity to interact with the reagent. The user should then withdraw the LETK swab from the LETK strip and prepare to analyze the results.

The user can refer to the "Test Stage 2 – Volatile Organic Solvents & Fuels" section of this manual (page 14) for a full breakdown of the color and chemical analysis for this stage.

If a positive result develops for this Test Stage, the user can consider the entire test result to be positive, and the user need not continue. If a positive result does not develop within 5 seconds, the Test Stage has provided a negative result, and the user can proceed onto Test Stage 3.





LETK/LTD | Testing Procedure

Test Stage 3:
The user should take the same LETK swab from Test Stage 2 and press firmly down against the LETK strip's third and final dry reagent zone – RZ3 (see LETK | Strip). The LETK swab should be pressed down perpendicularly to the LETK strip. The user should continue to dab around the reagent test zone for another 2-3 seconds to ensure that the sample has ample opportunity to interact with the reagent. The user should then withdraw the LETK swab from the LETK strip and prepare to analyze the results.

The user can refer to the "Test Stage 3 – Acids & Bases" section of this manual (page 15) for a full breakdown of the color and chemical analysis for this stage.

If a positive result develops for this Test Stage, the user can consider the entire test result to be positive. If a positive result does not develop within 2 seconds, the Test Stage has provided a negative result, and the outcome of the LETK test is negative.

LETK/LTD | Reading Test Stage Results

Prior to testing, the user should be familiar with the color that indicates a positive result for each stage. The user can refer to the reference cards, as well as the corresponding Test Stage Analysis sections at the back of this manual as a reference guide for the color analysis for each of the Test Stages.

During each of the test stages, the user must be prepared to look for the corresponding color change that is indicative of a positive result. The color development may occur on either or both of the LETK strip and LETK swab, and the user should carefully inspect both for evidence of this result. An absence of color on either the LETK strip or LETK swab does not in itself constitute a negative result, as the color change could be present on the other.

The color change of a positive result should be very rapid and permanent, and though the color may vary in intensity and hue due, it should contain the primary color expected of a positive result.

The presence of this color change indicates a positive result for the presumed presence of the explosives group in question in the sample.

The absence of any color change, or a color change that is not consistent with the primary color expected of a positive result is classified as a negative result for the presumed presence of the explosives group in question in the sample.

NOTE: The chemicals printed in the dry reagent zones of the LETK are colored. During analysis, the presence of these colors on the LETK strip or LETK swab, or a water-diluted hue of these colors, do not indicate a positive result during testing. The color development indicative of a positive result will be distinct and separate from the color present in the reagent. It is recommended that users trial a negative result using a blank swab in order to assess the color effects of the reagent during testing.

Clear Color Development on Swab or Strip = Positive Result

No New Color Development on Swab or Strip = Negative Result

LETK/LTD | Test Stage 1 - Peroxides

The first LETK Test Stage reagent zone (RZ1) should be a solid rectangle that is light blue in color, situated at the top of the strip. If the test zone on your LETK strip does not contain the square of reagent, or the reagent square is not as expected, try using a different LETK strip. If the issue persists, contact a member of the SwabTek team and be prepared to submit pictures.

Note: The presence of the blue color of the reagent, or a water-diluted hue of this color, does not indicate a positive result during testing. The color development indicative of a positive result will be distinct and separate from the color present in the reagent. It is recommended that users trial a negative result using a blank swab and distilled water in order to assess the color effects of the reagent during testing.

The first Test Stage of the LETK screens for the presumed presence of Peroxides.

Test Target Chemical Group	Color Change for Positive Result	Color Development Time
Peroxides	Brown/Black	10 seconds

Test Result	Color Reaction	
Positive for Peroxides	Development of Brown/Black Color	
Negative for Peroxides	No Color Development	

Notes
Some cosmetic products containing alkaline ammonia or other peroxide compounds may cause False positive results for this test.

LETK/LTD | Test Stage 2 - Volatile Organic Solvents & Fuels

The second LETK Test Stage reagent zone (RZ2) is indicated by a small dark purple square in the center of the strip, surrounded by the white of the paper. If the test zone on your LETK strip does not contain the square of reagent, or the reagent square is not as expected, try using a different LETK strip. If the issue persists, contact a member of the SwabTek team and be prepared to submit pictures.

Note: The presence of the purple color of the reagent, or a water-diluted hue of this color, does not indicate a positive result during testing. The color development indicative of a positive result will be distinct and separate from the color present in the reagent. It is recommended that users trial a negative result using a blank swab and distilled water in order to assess the color effects of the reagent.

The second Test Stage of the LETK screens for the presumed presence of Volatile Organic Solvents and Fuels (Acetone, Diesel, high percentage-alcohol).

Test Target Chemical Group	Color Change for Positive Result	Color Development Time
Volatile Organic Solvents	Fluorescent Pink/Red	10 seconds
Fuels	Pink/Gold Hue	10 seconds

Test Result	Color Reaction	
Positive for Solvents and/or Fuels	Development of Pink Color	
Negative for Solvents and/or Fuels	Dilution of the Purple Color of Reagent Square	

Notes
High percentage alcohol and solvent-based products (some pharmaceuticals and cosmetic products) can cause False positive results. Purple reagent may be absorbed into swab tip during testing, causing a light pink discoloration. This is not a positive result, as color change is not result of new color development. It is recommended that users familiarize themselves with a negative result for this test stage prior to field use.

LETK/LTD | Test Stage 3 - Acids & Bases

The third LETK Test Stage reagent zone (RZ3) is indicated by a grainy yellow/gold rectangle at the base of the strip. If the test zone on your LETK strip does not contain the square of reagent, or the reagent square is not as expected, try using a different LETK strip. If the issue persists, contact a member of the SwabTek team and be prepared to submit pictures.

Note: The presence of the yellow/gold color of the reagent, or a water-diluted hue of this color, does not indicate a positive result during testing. The color development indicative of a positive result will be distinct and separate from the color present in the reagent. It is recommended that users trial a negative result using a blank swab in order to assess the color effects of the reagent during testing.

The third Test Stage of the LETK screens for the presumed presence of Acids (sulfuric acid, hydrochloric acid, nitric acid) and Alkalis/Bases (hydrazine) at extreme pH levels, which would not ordinarily be associated with consumer liquids (cosmetics, etc.)

Test Target Chemical Group	Color Change for Positive Result	Color Development Time
Acids	Pink/Red	< 2 seconds
Bases	Blue/Purple	< 2 seconds

Test Result	Color Reaction	
Positive for Acids	Development of Pink/Red Color	
Positive for Alkalis/Bases	Development of Blue/Purple Color	
Negative for Acids/Bases	No Color Development	

Notes
Some cosmetic products containing alkaline ammonia or other peroxide compounds may cause False positive results for this test.

LETK/LTD | Troubleshooting

The SwabTek LETK test kits are designed to detect the presumed presence of liquids that are explosives or can be used in the manufacture of explosive or energetic materials. The results of the test are presumptive only, indicating to the best of the test's capability a presumption that the target compound is or is not likely to be present in a given sample. Presumptive tests should not be used to determine the legitimacy or legality of the presence of explosives.

As SwabTek's tests are a color change test that rely on the user to draw conclusions about the results, there are a number of factors to consider about the use of the test. The following can result in mistaken readings that are based on human or procedural error, rather than an error with the color chemistry:

- Improper/non-white lighting used in the test procedure
- Partial to full color blindness of the operator
- Highly colored/color-producing samples used in testing (wet or dry paints, dyes, etc.)
- Highly viscous or thick samples used in testing (candle wax, silicone oil, engineering grease, etc.)
- Testing conditions where the LETK strip, LETK swab, or sample may have been compromised (heavy rain, smoke, extreme temperatures, etc.)

For LETK Test Stages that are known to produce either False Positive or potentially misleading results under particular circumstances, these samples and scenarios are detailed in the Notes sections for the Test Stage Analysis tables found in this user manual. It is important that users be cognizant of these known False positives and misleading results and use their best judgment in applying this knowledge in the context of their testing.

If the user is ever unsure about the procedure or result of a test, the test should be re-conducted. If the user is uncertain about an element of conducting or analyzing the test, and cannot find answers in the reference materials, they should contact a member of SwabTek's team with relevant support (photographs, descriptions, test information) if applicable.

Contact SwabTek

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