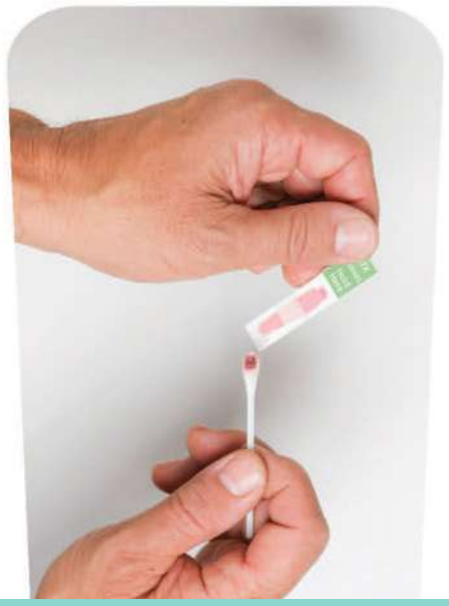
SwabTek
Veriteque USA, Inc.



DRY EXPLOSIVES TEST KIT MANUAL

Document · DETK-MANUAL
Version · 1.1

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DETK - MANUAL

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

DETK | 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 Dry Explosives Test Kit (DETK) is a single use, dry reagent-based spot test that is designed to test for explosives substances on any surface.

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 Dry Explosives Test to screen for a variety of potential explosives indicators.

The test stages are as follows:

- Test Stage 1: Nitroaromatics (e.g. TNT, DNT)
- Test Stage 2: Nitrates, Nitroamines, Nitroesters
- Test Stage 3: Oxidizers (e.g. Hydrogen Peroxide, Chlorate)

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

Since the DETKs 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.

DETK | Test Strip

The DETK test strip is a paper strip with five dry test zones printed onto the surface. These five 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. Since there are five different dry test zones, but only three different test stages, the user must be aware that some of the stages may use multiple zones.

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 five individual reagent zones can be identified by the five colored powder sections that are printed onto the white section of the strip, separated by dashed lines.

DETK | Reagent Zones

1. The first reagent zone (RZ1) is found just below the "Hold Here" label that indicates the top of the strip. RZ1 is used in both Test Stage 1 and as part of Test Stage 2.

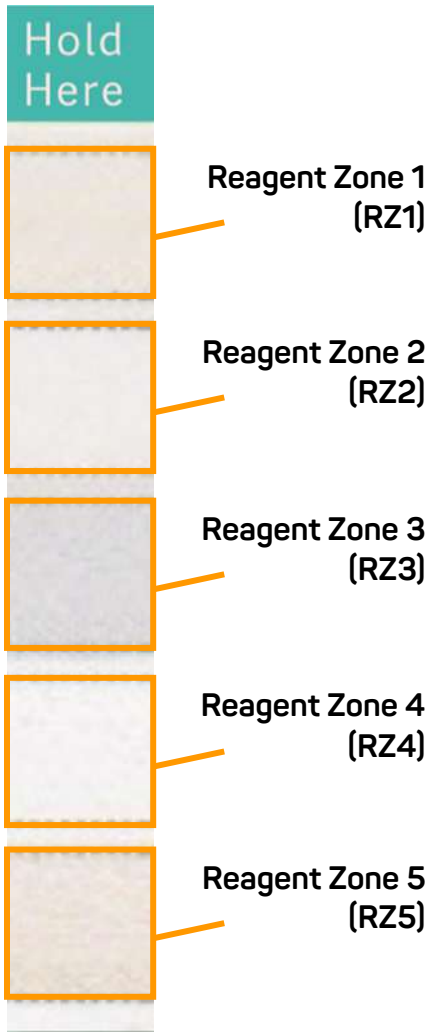
2. The second reagent zone (RZ2) is found just below RZ1. RZ2 is used as a part of Test Stage 2.

3. The third reagent zone (RZ3) is found just below RZ2. RZ3 is used as a part of Test Stage 2.

4. The fourth reagent zone (RZ4) is found just below RZ3. RZ4 is used as a part of Test Stage 3.

5. The second reagent zone (RZ5) is found just below RZ4. RZ5 is used as a part of Test Stage 3.

Since the reagents are printed onto the test zones 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 a message indicating to "Hold Here".



DETK | Test Swab

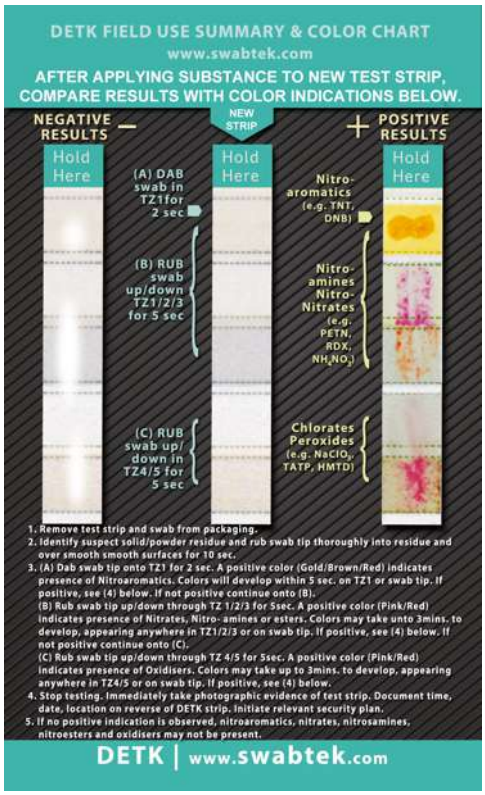
The DETK test swab is provided to help isolate and collect suspect residues and transfer the samples to the test strip's reagent test zones for analysis. Each test swab is pre-wetted with a solvent to assist in the collection of the sample.

The test swabs are delivered individually in a single, sealed sachet that protects it from exposure. The sealed sachet helps to ensure that the solvent remains on the swab tip and does not evaporate. The sachet is printed with information about the swab, and the end that should be opened to extract the swab.

DETK | Reference Card

All DETK tests should be used in conjunction with a DETK reference card that is distributed to accompany each test. The DETK 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 DETK 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.



DETK | General Testing Process

When residue containing a detectable explosive substance is transferred to and mixed with the reagent zones as per the Test Stage instructions, 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 during the first Test Stage for the DETK strip is a DARK RED/BROWN. Any indication of the development of this red/brown color 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 DETK, the pairing of Test Stage to Reagent Zone(s) is as follows.

- Test Stage 1: Reagent Zone 1
- Test Stage 2: Reagent Zone 1, Reagent Zone 2, Reagent Zone 3 (all rubbed together)
- Test Stage 3: Reagent Zone 4, Reagent Zone 5 (both rubbed together)

NOTE: A positive result in any of the individual test stages (Test Stage 1, Test Stage 2, Test Stage 3) is sufficient indication of the presumptive presence of explosives or explosive precursors and is therefore a positive result for the entire DETK. 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.

DETK | Post-Test Procedure

Following the testing procedure, it is recommended that users take photographic record of the test result, both the DETK strip and DETK 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 DETK strip, DETK 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 DETK strip and DETK swab do not contain any dangerous or hazardous materials, and do not require any special disposal procedures (acid neutralization, HAZMAT disposal, etc.)

DETK | Reading Test Stage Results

Prior to testing, the user should be familiar with the color that indicates a positive result. The user can refer to the reference cards, as well as the corresponding color indications tables under the Test Analysis sections for each of the three 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 DETK strip and DETK swab, and the user should carefully inspect both for evidence of this result. An absence of color on either the DETK strip or DETK 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 narcotic 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 narcotic in question in the sample.
NOTE: The chemicals printed in the dry reagent zones of the DETK may be lightly colored. During analysis, the presence of these colors on the DETK strip or DETK 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.

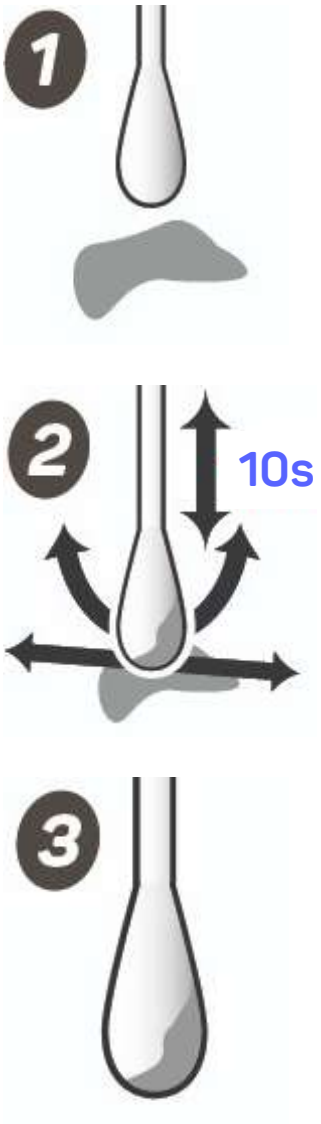
DETK | Sample Collection Instructions

Once the user has identified the suspect substance, residue, or surface, the first step of the test is to gather the sample. The user should open the DETK swab sachet from the correct end and withdraw the swab from the packaging. The swab should be held perpendicular to the 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 15 seconds. The swab should be dabbed with enough pressure to embed the test substance into the tip of the swab, but not so vigorously that the substance is disturbed or that the sample is knocked off of the swab's tip.

The user should aim to collect as much 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 result creates a strong and definitive color change.

If the 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.

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



DETK | Test Stage 1 - Procedure

Directly following sample collection, the user should begin the sample testing procedure. The user should start by removing the DETK 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.
The user should take the DETK swab with the collected sample (see DETK | Sample Collection Instructions) and press firmly down against the DETK strip's first dry reagent zone – RZ1 (see DETK | Strip). The DETK swab should be pressed down perpendicularly to the DETK strip and held for 2-3 seconds. Once this is completed, the user should continue to dab around the reagent test zone for another 5-10 seconds to ensure that the sample has ample opportunity to interact with the reagent. The user should then withdraw the DETK swab from the DETK strip and prepare to analyze the results. 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.

DETK | Test Stage 1 - Analysis

The first stage of the DETK Test occurs in the first reagent zone (RZ1), situated in the first square at the top of the DETK strip. The reagent zone used in the stage of this test may be lightly colored by the dry reagent that is printed on the test strip.

Note: The presence of the 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 first Test Stage of the DETK screens for the presumed presence of Nitro-aromatics, including: TNT, DNT, DNB, etc. A positive result for this stage is indicated by a Deep Red/Brown or Gold color development in RZ1.

Test Target Chemical Group	Color Change for Positive Result	Color Development Time
Nitro-aromatics	**Deep Red/Brown or Gold**	**5-10 seconds**

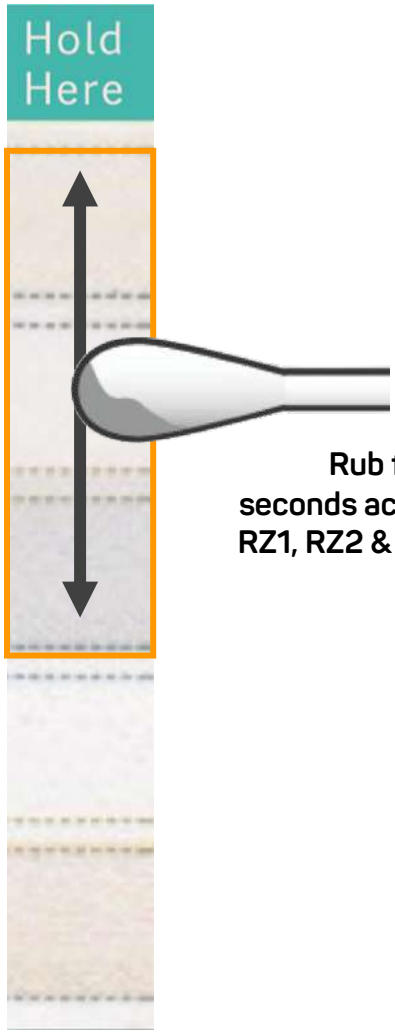
Test Result	Color Reaction	
Positive for Nitro-aromatics	Development of Deep Red/Brown or Gold Color	
Negative for Nitro-aromatics	No Color Development	

Notes
Positive color development will be stable for several minutes, but may fade over time

DETK | Test Stage 2 - Procedure

The user should take the DETK swab used in Test Stage 1 and press down against the DETK strip's first dry reagent zone – RZ1. The user should then rub the swab through RZ1 and the next two reagent zones on the strip (RZ2 & RZ3), in a back and forth motion (up-and-down or side-to-side, depending on how strip is situated). The user should rub for 5 seconds, exerting enough force to disturb the reagents in the test zones, but not so much that the sample or strip are damaged. The reaction occurring at this stage is the result of the combination of the reagents in all three zones (RZ1, RZ2, and RZ3), and the user should ensure that all three, and only these three, reagent zones are used in this stage.

Once the user has finished combining the reagents in RZ1, RZ2, and RZ3 with the sample from the test swab, they should withdraw the DETK swab from the DETK strip and prepare to analyze the results. 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 90-180 seconds, the Test Stage has provided a negative result, and the user can proceed onto Test Stage 3.



Rub for 5 seconds across RZ1, RZ2 & RZ3

DETK | Test Stage 2 - Analysis

The second stage of the DETK Test occurs in each of the first three reagent zones (RZ1, RZ2, & RZ3), situated in the first three squares at the top of the DETK strip. The reagent zones used in the stage of this test may be lightly colored by the dry reagent that is printed on the test strip.

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

The second Test Stage of the DETK screens for the presumed presence of Nitrates, Nitro-Amines, and Nitro-Esters, including: NH_4NO_3, RDX, PETN, etc. A positive result for this stage is indicated by a red/pink color development in any of the first three reagent zones (RZ1, RZ2, RZ3).

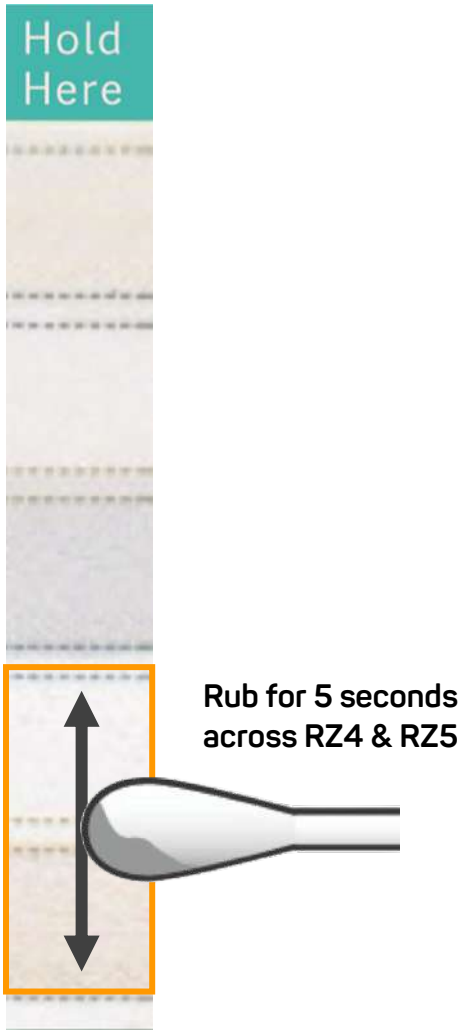
Test Target Chemical Group	Color Change for Positive Result	Color Development Time
Nitrates, Nitro-Amines, Nitro-Esters	**Red/Pink**	**120-180 seconds**

Test Result	Color Reaction	
Positive for Nitrates, Nitro-Amines, Nitro-Esters	Development of Red/Pink Color	
Negative for Nitrates, Nitro-Amines, Nitro-Esters	No Color Development	

Notes
Since this stage spans 3 reagent zones, user must check for color development on the swab tip and in each of the 3 reagent zones. Color development in any of the test zones, or on the tip of the swab, indicates a positive result. Color development of positive result may intensify over the course of several minutes.

DETK | Test Stage 3 - Procedure

The user should take the DETK swab used in the first two Test Stages and press down against the DETK strip's fourth dry reagent zone – RZ4. The user should then rub the swab through RZ4 and the last reagent zone on the strip (RZ5), in a back and forth motion (up-and-down or side-to-side, depending on how strip is situated). The user should rub for 5 seconds, exerting enough force to disturb the reagents in the test zones, but not so much that the sample or strip are damaged. The reaction occurring at this stage is the result of the combination of the reagents in both the fourth and fifth zones (RZ4 and RZ5), and the user should ensure that both, and only these two, reagent zones are used in this stage.
Once the user has finished combining the reagents in RZ4 and RZ5 with the sample from the test swab, they should withdraw the DETK swab from the DETK strip and prepare to analyze the results. 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 90-180 seconds, the Test Stage has provided a negative result, and the overall result for the DETK is negative.



DETK | Test Stage 3 - Analysis

The third stage of the DETK Test occurs in the last two reagent zones (RZ4 & RZ5), situated in the two squares at the base of the DETK strip. The reagent zones used in the stage of this test may be lightly colored by the dry reagent that is printed on the test strip.

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

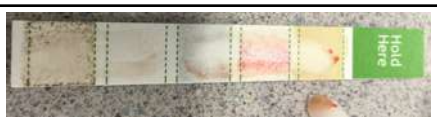
The third Test Stage of the DETK screens for the presumed presence of Chlorates and Peroxides, including: TATP, HMTD, NaClO3, etc. A positive result for this stage is indicated by a red/pink color development in any of the two reagent zones (RZ4, RZ5).

Test Target Chemical Group	Color Change for Positive Result	Color Development Time
Chlorates & Peroxides	**Red/Pink**	**60-180 seconds**

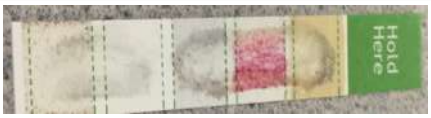
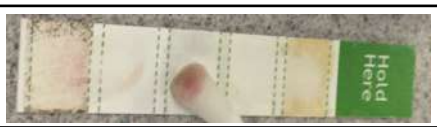
Test Result	Color Reaction	
Positive for Chlorates & Peroxides	Development of Red/Pink Color	
Negative for Chlorates & Peroxides	No Color Development	

Notes
Since this stage spans 2 reagent zones, user must check for color development on the swab tip and in each of the 2 reagent zones. Color development in any of the test zones, or on the tip of the swab, indicates a positive result. Color development of positive result may intensify over the course of several minutes.

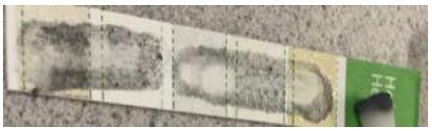
DETK | Color Chart – Commercial & Military Explosives

Substance	Color Reaction	
RDX		**POSITIVE** (1 minute)
HMX		**POSITIVE** (1 minute)
Black Powder		**POSITIVE** (1 minute)
C-2		**POSITIVE** (1 minute)
C-4		**POSITIVE** (1 minute)
SEMTEX		**POSITIVE** (1 minute)
PETN		**POSITIVE** (30 seconds)
TNT		**POSITIVE** (3 seconds)

DETK | Color Chart – Homemade Explosives

Substance	Color Reaction	
Ammonium Nitrate Aluminum Powder		**POSITIVE** **(1 minute)**
Ammonium Nitrate Nitro Methane		**POSITIVE** **(1 minute)**
Homemade C4 Potassium Chlorate + Vaseline		**POSITIVE** **(15 seconds)**
Ammonium Nitrate + Icing Sugar		**POSITIVE** **(1 minute)**
Sodium Chlorate		**POSITIVE** **(15 seconds)**
Urea Nitrate + Icing Sugar		**POSITIVE** **(15 seconds)**
Potassium Bromate		**POSITIVE** **(10 seconds)**

DETK | Color Chart – Known Negative Results

Substance	Color Reaction
Flashpowder - (Potassium Persulphate + Aluminum Powder)	**NEGATIVE** – This compound produces a negative result as the DETK does not screen for perchlorates or persulphates. 
Urea	**NEGATIVE** – This compound produces a negative result as the DETK does not screen for urea. 

DETK | Troubleshooting

The SwabTek DETK test kits are designed to detect the presumed presence of compounds 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 DETK strip, DETK swab, or sample may have been compromised (heavy rain, smoke, extreme temperatures, etc.)

Many explosives can be made from commonly available materials which have legitimate commercial and private applications. In these instances, the DETK test will provide a positive result for the presence of explosives materials, and it is up to the experience, knowledge, and judgment of the user to determine the severity of the identified threat (for example, in the case of cosmetic or hair products containing peroxides).

Some military & commercial-grade explosives may be highly viscous, thick, or waxy, like C-2, C-4, SEMTEX, etc. Such samples, if they should contain compounds that the DETK tests for, will still register a positive result, but may require more vigorous rubbing/swabbing to ensure the compound breaks down during the testing process.

If the user is ever unsure about the procedure or result of a test, the test should be re-done. 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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