



**Sofia**<sup>®</sup>  
SARS Antigen FIA

For *in vitro* diagnostic use.

A symbols glossary can be found at [quidel.com/glossary](http://quidel.com/glossary).

### **INTENDED USE**

The Sofia SARS Antigen FIA is a lateral flow immunofluorescent sandwich assay that is used with the Sofia and Sofia 2 instrument intended for the qualitative detection of the nucleocapsid protein antigen from SARS-CoV-2 in direct anterior nasal swab specimens from individuals who are either suspected of COVID-19 by their healthcare provider within the first five days of the onset of symptoms, or from individuals without symptoms or other epidemiological reasons to suspect COVID-19 when tested twice over two or three days with at least 24 hours and no more than 36 hours between tests.

The Sofia SARS Antigen FIA does not differentiate between SARS-CoV and SARS-CoV-2.

Results are for the identification of SARS-CoV-2 nucleocapsid protein antigen. Antigen is generally detectable in upper respiratory specimens during the acute phase of infection. Positive results indicate the presence of viral antigens, but clinical correlation with patient history and other diagnostic information is necessary to determine infection status. Positive results do not rule out bacterial infection or co-infection with other viruses. The agent detected may not be the definite cause of disease. Laboratories within the United States and its territories are required to report all positive results to the appropriate public health authorities.

Negative results should be treated as presumptive, do not rule out SARS-CoV-2 infection, and should not be used as the sole basis for treatment or patient management decisions, including infection control decisions. Negative results should be considered in the context of a patient's recent exposures, history and the presence of clinical signs and symptoms consistent with COVID-19, and confirmed with a molecular assay, if necessary, for patient management. For serial testing programs, additional confirmatory testing with a molecular test for negative results may be necessary, if there is a high likelihood of SARS-CoV-2 infection, such as in an individual with as a close contact with COVID-19 or with suspected exposure to COVID-19 or in communities with high prevalence of infection. Additional confirmatory testing with a molecular test for positive results may also be necessary, if there is a low likelihood of SARS-CoV-2 infection, such as in individuals without known exposures to SARS-CoV-2 or residing in communities with low prevalence of infection.

The Sofia SARS Antigen FIA is intended for use by trained clinical laboratory personnel and individuals trained in point of care settings, and proficient in performing tests using the Sofia and Sofia 2 instruments.

The Sofia SARS Antigen FIA should be used with Sofia or Sofia 2.

### **SUMMARY AND EXPLANATION**

SARS-CoV-2, also known as the COVID-19 virus, was first identified in Wuhan, Hubei Province, China December 2019. This virus, as with the novel coronavirus SARS-1 and MERS, is thought to have originated in bats, however the SARS-CoV-2 may have had an intermediary host such as pangolins, pigs or civets.<sup>1</sup> The WHO

declared that COVID-19 was a pandemic on March 11, 2020, and human infection has spread globally, with hundreds of thousands of confirmed infections and deaths.<sup>2</sup>

The median incubation time is estimated to be 5.1 days with symptoms expected to be present within 12 days of infection.<sup>3</sup> The symptoms of COVID-19 are similar to other viral respiratory diseases and include fever, cough and shortness of breath.<sup>4</sup>

### **PRINCIPLE OF THE TEST**

The Sofia SARS Antigen FIA employs immunofluorescence technology in a sandwich design that is used with Sofia and Sofia 2 to detect nucleocapsid protein from SARS-CoV and SARS-CoV-2 in respiratory specimens taken from patients with signs and symptoms who are suspected of COVID-19, or taken from asymptomatic individuals being tested serially, as described in the authorized intended use. This test allows for the detection of SARS-CoV and SARS-CoV-2. The test detects, but does not differentiate, between the two viruses.

The patient sample is placed in the Reagent Tube, during which time the virus particles in the sample are disrupted, exposing internal viral nucleoproteins. After disruption, the sample is dispensed into the Test Cassette sample well. From the sample well, the sample migrates through a test strip containing various unique chemical environments. If SARS-CoV or SARS-CoV-2 viral antigen is present, they will be trapped in a specific location.

**NOTE:** Depending upon the user's choice, the Test Cassette is placed inside Sofia or Sofia 2 for automatically timed development (WALK AWAY Mode) or placed on the counter or bench top for a manually timed development and then placed into Sofia or Sofia 2 to be scanned (READ NOW Mode).

Sofia and Sofia 2 will scan the test strip and measure the fluorescent signal by processing the results using method-specific algorithms. Sofia and Sofia 2 will display the test results (Positive, Negative, or Invalid) on the screen.

### **REAGENTS AND MATERIALS SUPPLIED**

25-Test Kit:

- Individually Packaged Test Cassettes (25): Monoclonal anti-SARS antibodies
- Reagent Tubes (25): Lyophilized buffer with detergents and reducing agents
- Reagent Solution (25): Ampoules with salt solution
- Sterile Nasal Swabs (25)
- Small, Clear 120 µL Fixed Volume Pipettes (25)
- SARS Positive Control Swab (1): Swab is coated with non-infectious recombinant SARS antigens
- Negative Control Swab (1): Swab is coated with heat-inactivated, non-infectious Streptococcus C antigen
- Package Insert (1)
- Quick Reference Instructions (1)
- QC Card (located on kit box)

### **MATERIALS NOT SUPPLIED IN KIT**

- Timer or watch
- Sofia or Sofia 2 Calibration Cassette (for use with either Sofia or Sofia 2)
- Sofia SARS Antigen Control Swab Set for additional QC (20384)

### **WARNINGS AND PRECAUTIONS**

- For *in vitro* diagnostic use.
- For prescription use only
- This test has been authorized only for the detection of proteins from SARS-CoV-2, not for any other viruses or pathogens.

- Do not use the kit contents beyond the expiration date printed on the outside of the box.
- Use appropriate precautions in the collection, handling, storage, and disposal of patient samples and used kit contents.
- Use of Nitrile, Latex (or equivalent) gloves is recommended when handling patient samples.
- Do not reuse the used Test Cassette, Fixed Volume Pipettes, Reagent Tubes, solutions, or Control Swabs.
- The user should never open the foil pouch of the Test Cassette exposing it to the ambient environment until the Test Cassette is ready for immediate use.
- Discard and do not use any damaged or dropped Test Cassette or material.
- The Reagent Solution contains a salt solution (saline). If the solution contacts the skin or eye, flush with copious amounts of water.
- To obtain accurate results, the Package Insert instructions must be followed.
- The Calibration Cassette must be kept in the provided storage pouch between uses.
- Inadequate or inappropriate sample collection, storage, and transport may yield false test results.
- Sample collection and handling procedures require specific training and guidance.
- When collecting an anterior nares swab sample, use the Nasal Swab supplied in the kit.
- Use the appropriate Fixed Volume Pipette in accordance with test procedures.
- **Do not pour sample from the Reagent Tube into the Test Cassette sample well. Use the provided Small, Clear 120 µL Fixed Volume Pipette when adding the sample to the Test Cassette.**
- To obtain accurate results, do not use visually bloody or overly viscous samples.
- Do not write on the barcode of the Test Cassette. This is used by Sofia and Sofia 2 to identify the type of test being run and to identify the individual Test Cassette so as to prevent a second read of the Test Cassette by the same Sofia or Sofia 2.
- As the detection reagent is a fluorescent compound, no visible results will form on the test strip. Sofia or Sofia 2 must be used for result interpretation.
- To obtain accurate results, an opened and exposed Test Cassette should not be used inside a laminar flow hood or in a heavily ventilated area.
- Testing should be performed in an area with adequate ventilation.
- Dispose of containers and unused contents in accordance with Federal, State, and Local regulatory requirements.
- Wear suitable protective clothing, gloves, and eye/face protection when handling the contents of this kit.
- Wash hands thoroughly after handling.
- For additional information on hazard symbols, safety, handling and disposal of the components within this kit, please refer to the Safety Data Sheet (SDS) located at [quidel.com](http://quidel.com).

#### **KIT STORAGE AND STABILITY**

Store the kit at room temperature, 59°F to 86°F (15°C to 30°C), out of direct sunlight. Kit contents are stable until the expiration date printed on the outer box. Do not freeze.

#### **QUALITY CONTROL**

***There are three types of Quality Control for Sofia and Sofia 2 and the Test Cassette: Sofia Calibration Check procedure, built-in procedural control features, and External Controls.***

##### ***Sofia Calibration Check Procedure***

**NOTE:** This is a “Calibration Check” procedure.

The Calibration Check Procedure should be performed every 30 days. Sofia can be set to remind the user to complete the Calibration Check Procedure.

The Calibration Check is a required function that checks Sofia optics and calculation systems using a specific Calibration Cassette. This Calibration Cassette is supplied with the Sofia Installation Pack. Refer to the Sofia User Manual for details regarding the Calibration Check Procedure.

**Important:** Ensure that the Calibration Cassette is stored in the provided storage pouch between uses to protect from exposure to light.

To check the calibration of Sofia, select “Calibration” from the Main Menu.



1. Following the prompts, insert the Calibration Cassette into Sofia and close the drawer. Sofia performs the Calibration Check automatically within two minutes with no user input required.



Sofia indicates when the Calibration Check is completed. Select **OK** to return to the Main Menu.

**NOTE:** If the Calibration Check does not pass, notify the on-site Supervisor or contact Quidel Technical Support for assistance Monday through Friday from 7:00 a.m. to 5:00 p.m. Pacific Time at 800.874.1517 (in the U.S.); 858.552.1100 (outside the U.S.); Fax: 858.455.4960; customerservice@quidel.com (Customer Service); technicalsupport@quidel.com (Technical Support); or contact your local distributor.

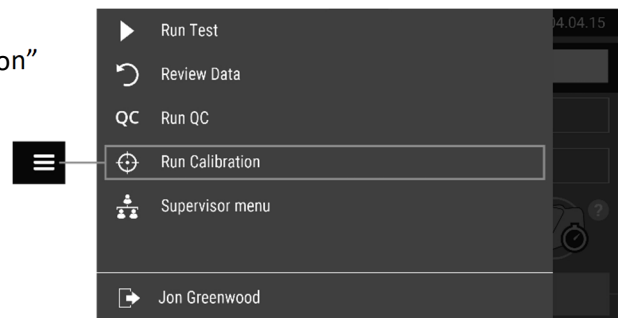
### ***Sofia 2 Calibration Check Procedure***

The Calibration Check Procedure should be performed every 30 days. Sofia 2 can be set to remind the user to complete the Calibration Check Procedure.

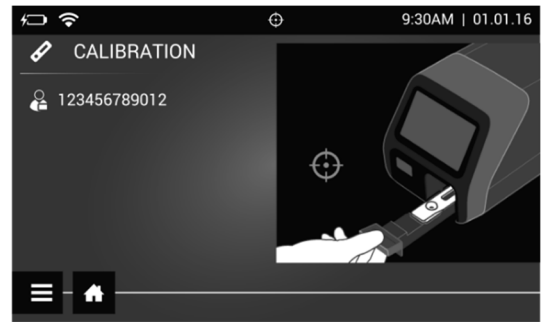
The Calibration Check is a required function that checks Sofia 2 optics and calculation systems using a specific Calibration Cassette. This Calibration Cassette is supplied with Sofia 2. Refer to the Sofia 2 User Manual for details regarding the Calibration Check Procedure.


**Important:** Ensure that the Calibration Cassette is stored in the provided storage pouch between uses to protect from exposure to light.

1. To check the calibration of Sofia 2, select “Run Calibration” from the Main Menu.



- Following the prompts, insert the Calibration Cassette into Sofia 2 and close the drawer. Sofia 2 performs the Calibration Check automatically within one minute with no user input required.



Sofia 2 indicates when the Calibration Check is completed. Select  to return to the Run Test screen.

**NOTE:** If the Calibration Check does not pass, notify the on-site Supervisor or contact Quidel Technical Support for assistance Monday through Friday from 7:00 a.m. to 5:00 p.m. Pacific Time at 800.874.1517 (in the U.S.); 858.552.1100 (outside the U.S.); Fax: 858.455.4960; customerservice@quidel.com (Customer Service); technicalsupport@quidel.com (Technical Support); or contact your local distributor.

### ***Built-in Procedural Controls***

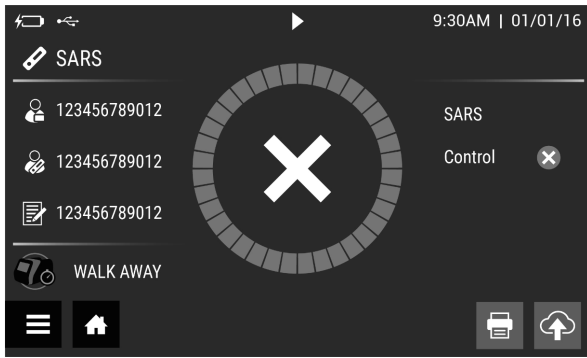
The Sofia SARS Antigen FIA contains a built-in procedural control feature. Each time a test is run in Sofia or Sofia 2, the procedural control zone is scanned by Sofia or Sofia 2 and the result is displayed on the Sofia or Sofia 2 screen.

The manufacturer's recommendation for daily control is to document the results of these built-in procedural controls for the first sample tested each day. This documentation is automatically logged into Sofia or Sofia 2 with each test result.

A valid result obtained from the procedural control demonstrates that the test flowed correctly and the functional integrity of the Test Cassette was maintained. **The procedural control is interpreted by Sofia or Sofia 2 after the Test Cassette has developed for 15 minutes. If the test does not flow correctly, Sofia or Sofia 2 will indicate that the result is invalid.** Should this occur, review the procedure and repeat the test with a new patient sample and a new Test Cassette.



***For example: This display shows an invalid result on Sofia.***



**For example: This display shows an invalid result on Sofia 2.**

### **External Quality Control**

External Controls may also be used to demonstrate that the reagents and assay procedure perform properly.

Quidel recommends that Positive and Negative External Controls be run:

- once for each untrained operator
- once for each new shipment of kits – provided that each different lot received in the shipment is tested
- as deemed additionally necessary by your internal quality control procedures, and in accordance with Local, State and Federal regulations or accreditation requirements.

The user must first select Run QC on the Main Menu of Sofia or Sofia 2 and then, when prompted, scan the QC Card (located on kit box). This card provides information specific to the kit lot, including lot number and expiration date.

The user will select the desired mode (WALK AWAY or READ NOW) then run the External Control swabs.

External Positive and Negative Control swabs are supplied in the kit and should be tested using the Swab Test Procedure provided in this Package Insert or in the Quick Reference Instructions. The SARS Positive Control Swab contains SARS antigen. **The Positive Control Swab must be run first, followed by the Negative Control Swab.**

When the QC run is complete, each result will be displayed as “Passed” or “Failed” on Sofia or ✓ or ✗ on Sofia 2, for the Positive Control and the Negative Control.

Do not perform patient tests or report patient test results if either of the QC test results fail. Repeat the test or contact Quidel Technical Support before testing patient samples.

If both the Positive and Negative Controls fail, repeat testing with new Positive and Negative Controls a second time. If only a single Control fails, the user has the option of repeating both the Positive and Negative Controls OR to repeat only the Control that failed. The user may select “Skip” on the Sofia display or >> on the Sofia 2 display to skip the Control test that previously passed. The QC Results will show a skipped Control test as “unknown” or >>> on Sofia 2.

Additional External Control swabs may be obtained separately by contacting Quidel Customer Support Services at 800.874.1517 (in the U.S.) or 858.552.1100.

## **SAMPLE COLLECTION AND HANDLING**

### **SAMPLE COLLECTION**

#### ***Direct Anterior Nares Swab Sample***

***Use the nasal swab supplied in the kit.***

Prior to collecting the nasal swab, the patient should be instructed to blow their nose. To collect a direct anterior nasal swab sample, carefully insert the swab (provided in the kit) into the nostril that presents the most secretion

under visual inspection. Using gentle rotation, push the swab until resistance is met at the level of the turbinates (less than one inch into the nostril). Rotate the swab several times against the nasal wall then remove it from the nostril. Specimens collected from asymptomatic individuals cannot be synchronized to onset of symptoms and should be evaluated as part of a serial testing program.

### SAMPLE TRANSPORT AND STORAGE

Samples should be tested as soon as possible after collection. Based on data generated with the SARS-CoV-2 Antigen FIA, direct anterior nasal swabs are stable for up to 48-hours at room temperature or 2° to 8°C.

### TEST PROCEDURE

**All clinical samples must be at room temperature before beginning the assay.**

Specimens processed in Reagent Tubes (rehydrated) have an in-use stability of up to 1 hour at room temperature, 59°F to 86°F (15°C to 30°C), out of direct sunlight.

**Expiration date:** Check expiration date on each individual test package or outer box before using. *Do not use any test past the expiration date on the label.*

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#### Swab Test Procedure

1. Verify that Sofia or Sofia 2 is set to the desired mode: **WALK AWAY** or **READ NOW**.  
See the “Using Sofia and Sofia 2” section for more information.
2. Dispense all of the Reagent Solution into the Reagent Tube. **Swirl the Reagent Tube to dissolve its contents.**
3. Place the patient swab sample into the Reagent Tube. Roll the swab at least 3 times while pressing the head against the bottom and side of the Reagent Tube.

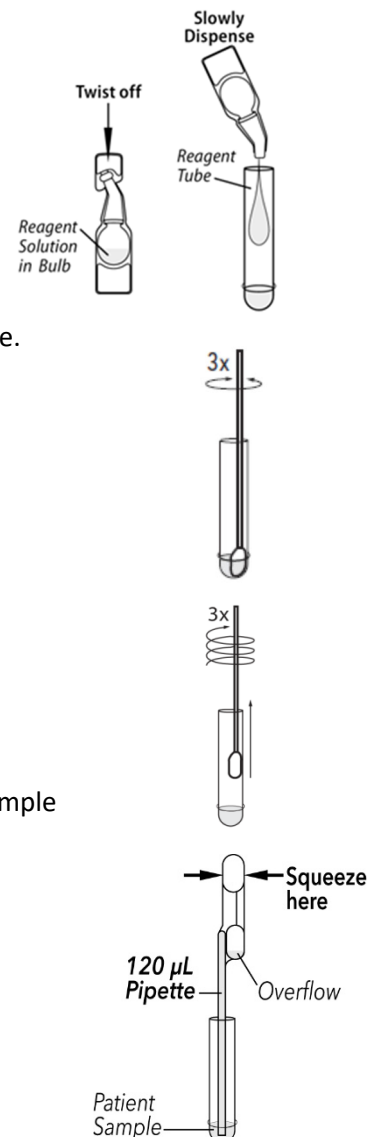
**Leave the swab in the Reagent Tube for 1 minute.**



4. Roll the swab head against the inside of the Reagent Tube as you remove it. Dispose of the used swab in your biohazard waste.
5. Fill the provided **Small, Clear 120 µL Fixed Volume Pipette** with the patient sample from the Reagent Tube.

**To fill the Fixed Volume Pipette with the patient sample:**

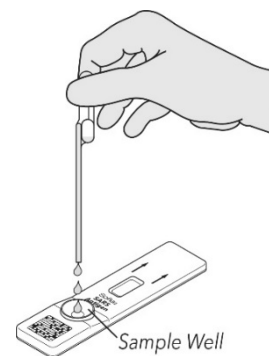
- a) **FIRMLY** squeeze the top bulb.
- b) Still squeezing, place the Pipette tip into the patient sample.
- c) With the Pipette tip still in the patient sample, slowly release pressure on bulb to fill the Pipette.



6. Firmly squeeze the top bulb to empty the contents of the **Small, Clear 120 µL Fixed Volume Pipette** into the Test Cassette sample well. Extra liquid left over in the overflow bulb should be left behind.

**NOTE:** The Fixed Volume Pipettes are designed to collect and dispense the correct amount of liquid sample. Discard the pipette in your biohazard waste.

**NOTE:** Do not pour sample from the Reagent Tube. Use the provided **Small, Clear 120 µL Fixed Volume Pipette**.



7. Promptly proceed to the next section, “Using Sofia and Sofia 2,” to complete the test.

## USING SOFIA AND SOFIA 2

### **WALK AWAY/READ NOW Modes**

Refer to the Sofia 2 User Manual for operating instructions.

Sofia and Sofia 2 may be set to two different modes (WALK AWAY and READ NOW). The procedures for each mode are described below.

### **WALK AWAY Mode**

In WALK AWAY Mode, the user **immediately** inserts the Test Cassette into Sofia or Sofia 2. Sofia and Sofia 2 scans the Test Cassette periodically during the test development time. Positive and negative test results will be displayed in 15 minutes.

### **READ NOW Mode**

**Critically important: Allow the test to develop for the FULL 15 minutes BEFORE placing it into Sofia or Sofia 2.**

The user must first place the Test Cassette onto the counter or bench top for 15 minutes (outside of Sofia 2) and manually time this development step. Then, the user inserts the Test Cassette into Sofia or Sofia 2. In READ NOW Mode, Sofia and Sofia 2 will scan and display the test result within 1 minute

**Warning: Results must not be interpreted past 30 minutes after inoculation. Using the Sofia or Sofia 2 past this time may result in false results.**

### **Tips for Batch Testing**

Depending on the workload, several options exist to make batch testing easier. The user can add the Reagent Solution to one or more Reagent Tubes, recap them, and store them on the bench at room temperature (RT) for up to 12 hours without loss of activity before adding the sample(s).

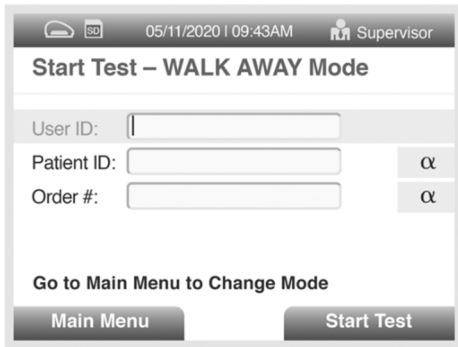
**Critically important:** The user should never open the foil pouch exposing the Test Cassette to ambient environment until ready for immediate use.

## **RUN TEST WITH SOFIA**

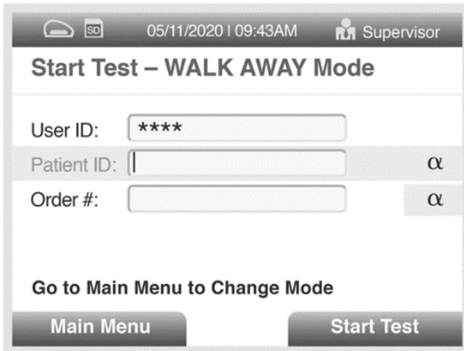
1. Input the User ID using the barcode scanner or manually enter the data using the key pad.

**NOTE:** If you mistakenly scan the incorrect barcode, use the Arrow Buttons on the Sofia key pad to re-highlight the field. Then simply rescan using the correct barcode, and the previous one will be overwritten with the correct barcode.

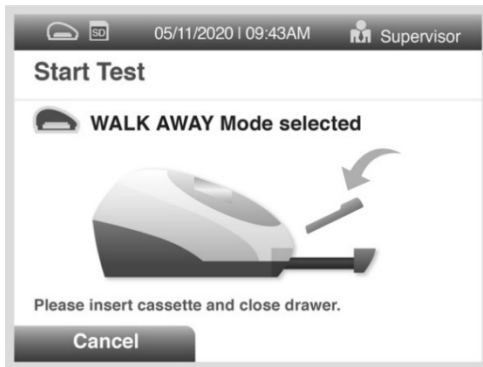




- Input the Patient ID or Order # using the barcode scanner or manually enter the data using the key pad.

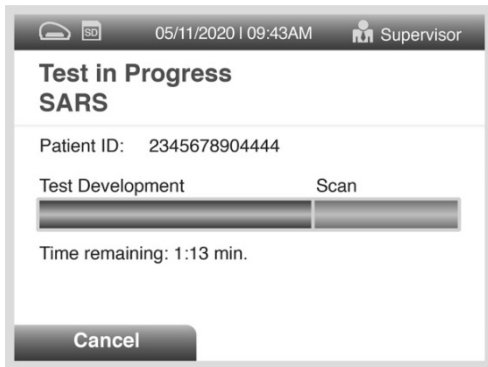


- Press Start Test and the Sofia drawer will automatically open.



- Verify that the correct development mode, WALK AWAY or READ NOW, has been selected. Insert the prepared patient Test Cassette into the drawer of Sofia and close the drawer.
- Sofia will start automatically and display the progress, as shown in the example below. In WALK AWAY Mode, the test results will be displayed on the screen in approximately 15 minutes. In READ NOW Mode, the test results will be displayed on the screen within 1 minute. See Interpretation of Results section.





***For example: This display shows that the test in WALK AWAY mode has 12 minutes, 13 seconds remaining. Sofia will read and display the results after 15 minutes.***

### INTERPRETATION OF RESULTS USING SOFIA

When the test is complete, the results will be displayed on the Sofia screen. The results can be automatically printed on the integrated printer if this option is selected. Test Lines, which are fluorescent, cannot be seen with the naked eye.

The Sofia screen will display results for the procedural control as being “valid or invalid,” and will individually provide a positive or negative result for SARS. If the procedural control is “invalid,” retest with a new patient sample and a new Test Cassette.

#### ***Positive Results:***



***For example: This display shows a valid positive result for SARS.***

**NOTE:** A positive result does not rule out co-infections with other pathogens.

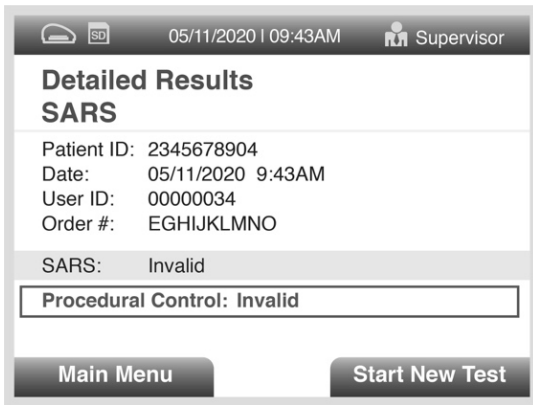
#### ***Negative Results:***



***For example: This display shows a valid negative result for SARS.***

**NOTE:** Negative results should be treated as presumptive and confirmation with a molecular assay, if necessary, for patient management, may be performed. For serial testing programs, additional confirmatory testing with a molecular test for negative results may be necessary after second negative result for asymptomatic patients, if there is a high likelihood of SARS-CoV-2 infection, such in an individual with as a close contract with COVID-19 or with suspected exposure to COVID-19 or in communities with high prevalence of infection. Additional confirmatory testing with a molecular test for positive results may also be necessary, if there is a low likelihood of SARS-CoV-2 infection, such as in individuals without known exposures to SARS-CoV-2 or residing in communities with low prevalence of infection.

### Invalid Results:



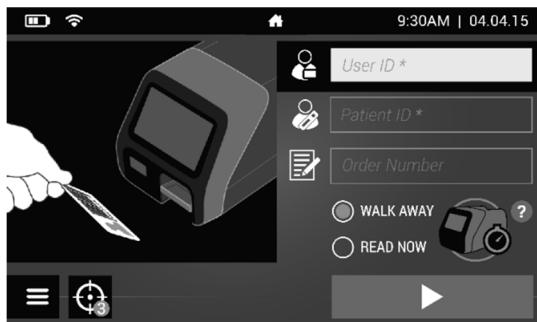
*For example: This display shows an invalid result.*

**Invalid Result:** If the test is invalid, a new test should be performed with a new patient sample and a new Test Cassette.

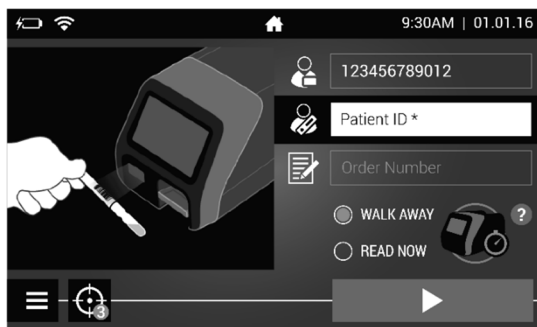
### RUN TEST WITH SOFIA 2

1. Input the User ID using the integrated barcode scanner or manually enter the data using the on-screen key pad.

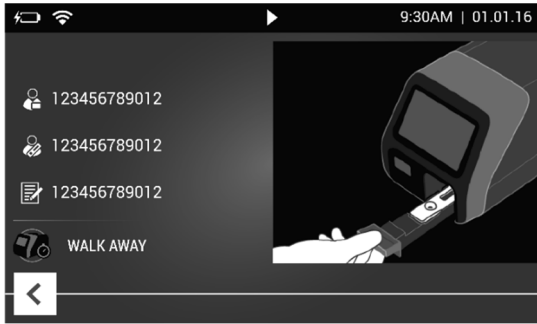
**NOTE:** If you mistakenly scan the incorrect barcode, select the field again to re-highlight it. Then simply rescan using the correct barcode, and the previous one will be overwritten with the correct barcode.



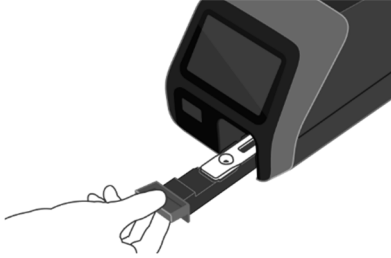
2. Input the Patient ID and Order #, if applicable, using the barcode scanner or manually enter the data using the on-screen key pad.



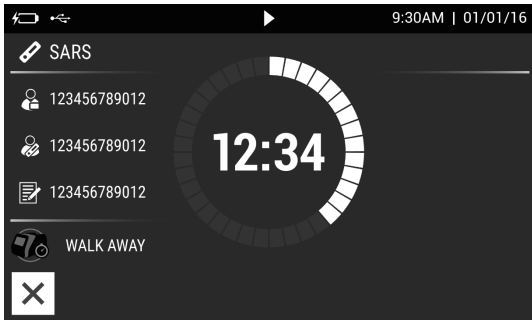
3. Verify that the correct development mode, WALK AWAY or READ NOW, has been selected. Press ► and open the Sofia 2 drawer.



4. Insert the prepared Test Cassette into the drawer of Sofia 2 and close the drawer.



5. Sofia 2 will start automatically and display the progress, as shown in the example below. In WALK AWAY Mode, the test results will be displayed on the screen in 15 minutes. In READ NOW Mode, the test results will be displayed on the screen within 1 minute. See Sofia 2 Interpretation of Results section.



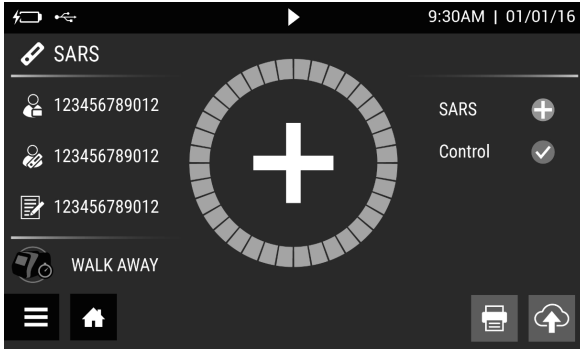
***For example: This display shows that the test in WALK AWAY Mode has 12 minutes, 34 seconds remaining. Sofia 2 will read and display the results in 15 minutes.***

## INTERPRETATION OF RESULTS USING SOFIA 2

When the test is complete, the results will be displayed on the Sofia 2 screen. Test Lines, which are fluorescent, cannot be seen with the naked eye.

The Sofia 2 screen will display results for the procedural control as being ✓ or ✗, and will individually provide a ⊕ or ⊖ result for SARS. If the procedural control is ✗ retest with a new patient sample and a new Test Cassette. If a printer is connected, the results can be printed manually by selecting the print icon while the test results are displayed on the screen.

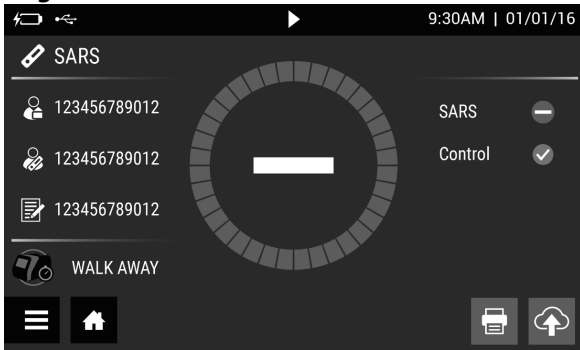
**Positive Results:**



***For example: This display shows a valid positive result for SARS.***

**NOTE:** A positive result does not rule out co-infections with other pathogens.

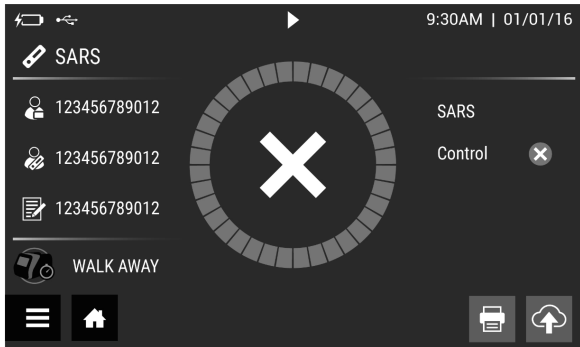
**Negative Results:**



***For example: This display shows a valid negative result for SARS.***

**NOTE:** Negative results should be treated as presumptive and confirmation with a molecular assay, if necessary, for patient management, may be performed. For serial testing programs, additional confirmatory testing with a molecular test for negative results may be necessary after second negative result for asymptomatic patients, if there is a high likelihood of SARS-CoV-2 infection, such as in an individual with as a close contact with COVID-19 or with suspected exposure to COVID-19 or in communities with high prevalence of infection. Additional confirmatory testing with a molecular test for positive results may also be necessary, if there is a low likelihood of SARS-CoV-2 infection, such as in individuals without known exposures to SARS-CoV-2 or residing in communities with low prevalence of infection.

**Invalid Results:**



***For example: This display shows an invalid result.***

**Invalid Result:** If the test is invalid, a new test should be performed with a new patient sample and a new Test Cassette.

## LIMITATIONS

- Use of viral transport media may result in decreased test sensitivity, and directly testing specimens is recommended.
- Remel M4 and M4RT should not be used with the Sofia SARS Antigen FIA Assay in either the Sofia or Sofia 2. Some lots of M4 and M4RT have been shown to cause false positive results when used with the Sofia SARS Antigen FIA Assay.
- The contents of this kit are to be used for the qualitative detection of SARS antigens from direct anterior nasal swabs only.
- This test detects both viable (live) and non-viable, SARS-CoV, and SARS-CoV-2. Test performance depends on the amount of virus (antigen) in the sample and may or may not correlate with viral culture results performed on the same sample.
- A negative test result may occur if the level of antigen in a sample is below the detection limit of the test or if the sample was collected or transported improperly.
- Failure to follow the Test Procedure may adversely affect test performance and/or invalidate the test result.
- Test results must be evaluated in conjunction with other clinical data available to the physician.
- Positive test results do not rule out co-infections with other pathogens.
- Positive test results do not differentiate between SARS-CoV and SARS-CoV-2.
- Negative test results are not intended to rule in other non-SARS viral or bacterial infections.
- Negative results should be treated as presumptive and confirmation with a molecular assay, if necessary for patient management, may be performed.
- If the differentiation of specific SARS viruses and strains is needed, additional testing, in consultation with state or local public health departments, is required.
- The performance of this test for SARS-CoV-2 was established based on the evaluation of a limited number of clinical specimens collected between April 2020 and June 2020. The clinical performance has not been established in all circulating variants but is anticipated to be reflective of the prevalent variants in circulation at the time and location of the clinical evaluation. Performance at the time of testing may vary depending on the variants circulating, including newly emerging strains of SARS-CoV-2 and their prevalence, which change over time.
- The performance of this test has not yet been clinically validated for use in patients without signs and symptoms of respiratory infection, or for serial screening applications and performance may differ in these populations.

## CLINICAL PERFORMANCE

### Patient Demographics

Patient demographics (gender, age, elapsed time from date of on-set) are available for the two hundred nine (209) samples used in the study.

The specimen positivity breakdown based on age of the patient:

Age	Sofia SARS Antigen FIA (N=209)		
	Total #	Total Positive	Prevalence
≤ 5 years	0	0	N/A
6 to 21 years	28	5	17.9%
22 to 59 years	156	22	16.0%
≥ 60 years	25	2	8.0%

The specimen positivity based on days post onset:

Days Post Symptom Onset	# Specimens Tested	# Positive Specimens	% Positive
0	9	0	0
1	32	5	15.6%
2*	61	11	18.0%
3	39	3	7.7%
4	24	5	20.8%
5	16	2	12.5%
6	11	2	18.2%
7	17	1	5.9%

**\*One specimen was Sofia SARS Antigen FIA Negative and Positive by Reference Extracted RT-PCR**

A study of two hundred nine (209) direct nasal swabs was performed. The samples were sequentially enrolled from symptomatic patients suspected of COVID-19 at five (5) locations and tested fresh at a single central laboratory. All patients had either a NP swab (for RT-PCR testing) and direct anterior nasal swab (for Sofia testing) or matched nasal swabs collected for RT-PCR and Sofia testing. The order of swab collection was randomized between assays. The Sofia SARS Antigen FIA was compared to a Reference Extracted RT-PCR assay. As with all antigen tests, performance may decrease as days since symptom onset increases due to lower viral loads later in the patient’s disease course. Similarly, the inability to synchronize asymptomatic individuals with onset of infection may impact performance as specimens may be tested when viral loads are below the assay’s limit of detection. Clinical studies in asymptomatic patients undergoing serial testing are ongoing to establish the clinical performance.

Sofia SARS Antigen FIA Assay	Reference Extracted RT-PCR assay			95% CI			
	POS	NEG	Total	PPA	96.7%	83.3%	99.4%
POS	29	0	29	NPA	100.0%	97.9%	100.0%
NEG	1	179	180	PPV	100.0%	88.3%	100.0%
Total	30	179	209	NPV	99.4%	96.9%	99.9%
				Prevalence	14.4%	10.2%	19.8%

The performance of this test has not yet been clinically validated for use in patients without signs and symptoms of respiratory infection or for serial screening applications, and performance may differ in these populations.

## ANALYTICAL PERFORMANCE

### Limit of Detection

#### a) Limit of Detection (LoD):

The Limit of Detection (LoD) of the Sofia SARS Antigen FIA was determined using limiting dilutions of heat-inactivated SARS-CoV-2 (bei Resources NR-52286). The NR-52286 is a preparation of SARS-Related Coronavirus 2 (SARS-CoV-2), isolate USA-WA1/2020, that has been inactivated by heating at 65°C for 30-minutes. The material was supplied frozen at a concentration of TCID<sub>50</sub> of 3.40 x10<sup>5</sup> per mL.

The study to determine the Sofia SARS Antigen FIA LoD was designed to reflect the assay when using direct swabs. In this study a NP swab was spiked with approximately 50-µL of the virus dilution in saline. The spiked swab was added to the Sofia SARS Antigen FIA extractant concurrently to a NP swab containing NP matrix. The swabs were processed concurrently according to the package insert.

The LoD was determined in three steps:

### 1. LoD Screening

10-fold dilutions of the heat inactivated virus were made in saline and processed for each study as described above. These dilutions were tested in triplicate. The concentration demonstrating 3 of 3 positives was chosen for LoD range finding.

Based on this testing, the concentration chosen was TCID<sub>50</sub> of 3.40 x10<sup>2</sup> per mL.

### 2. LoD Range Finding

Five (5) doubling dilutions were made of the TCID<sub>50</sub> of 3.40 x10<sup>2</sup> per mL concentration in saline processed for the study as described above. These dilutions were tested in triplicate. The concentration demonstrating 3 of 3 positives was chosen for LoD confirmation.

Based on this testing the concentration chosen was TCID<sub>50</sub> of 1.13 x10<sup>2</sup> per mL.

### 3. LoD Confirmation

The concentration TCID<sub>50</sub> of 1.13 x10<sup>2</sup> per mL dilution was tested an additional seventeen (17) times, for a total of twenty (20) results. Twenty (20) of twenty (20) results were positive.

Based on this testing the concentration was confirmed as:

Swab LoD: TCID<sub>50</sub> 1.13 x10<sup>2</sup> per mL

### 4. LoD Comparison between Instruments

To compare the LoD between the Sofia and Sofia 2 a study was performed using concurrent testing of 1x and 2x LoD concentrations (1.13 x10<sup>2</sup> and 2.26 x10<sup>2</sup>, respectively) of heat-inactivated SARS-CoV-2.

The two instruments generated matching LoDs of TCID<sub>50</sub> 2.26 x10<sup>2</sup> in this study.

#### b) Cross-Reactivity:

Cross-reactivity and potential interference of the Sofia SARS Antigen FIA was evaluated by testing various microorganisms (8), viruses (16) and negative matrixes (3) with the Sofia SARS Antigen FIA. Each organism and virus were tested in triplicate in the absence or presence of TCID<sub>50</sub> 2.26 x10<sup>2</sup> per mL of heat inactivated SARS-CoV-2. The final concentration of the organisms and viruses are documented in the Table below.

Cross-Reactivity: Sofia SARS Antigen FIA – Wet testing					
Virus/Bacteria/Parasite*	Strain	Source / Sample type	Concentration	Cross-Reactive Results**	Interference Results**
Adenovirus	Type 1	Isolate	1 x 10 <sup>5.53</sup> U/mL	Negative	Positive
Coronavirus	229e	Isolate	1 x 10 <sup>5.10</sup> U/mL	Negative	Positive
Coronavirus	OC43	Isolate	9.55 x 10 <sup>5</sup> TCID <sub>50</sub> /mL	Negative	Positive
Coronavirus	NL63	Isolate	5 x 10 <sup>3.67</sup> U/mL	Negative	Positive
MERS-CoV (heat-inactivated)	Florida/USA-2_Saudia Arabia_2014	Isolate	1.17 x 10 <sup>5</sup> TCID <sub>50</sub> /mL	Negative	Positive
<i>Mycoplasma pneumoniae</i>	M129	Isolate	3 x 10 <sup>6</sup> CCU/mL	Negative	Positive
<i>Streptococcus pyogenes</i>	Z018	Isolate	3.8 x 10 <sup>6</sup> cfu/mL	Negative	Positive
Influenza A H3N2	Brisbane/10/07	Isolate	1 x 10 <sup>5.07</sup> U/mL	Negative	Positive
Influenza A H1N1	New Caledonia/20/99	Isolate	1 x 10 <sup>5.66</sup> U/mL	Negative	Positive



Cross-Reactivity: Sofia SARS Antigen FIA – Wet testing					
Virus/Bacteria/Parasite*	Strain	Source / Sample type	Concentration	Cross-Reactive Results**	Interference Results**
Influenza B	Brisbane/33/08	Isolate	1 x 10 <sup>5.15</sup> U/mL	Negative	Positive
Parainfluenza	Type 1	Isolate	1 x 10 <sup>5.01</sup> U/mL	Negative	Positive
Parainfluenza	Type 2	Isolate	1 x 10 <sup>5.34</sup> U/mL	Negative	Positive
Parainfluenza	Type 3	Isolate	8.5 x 10 <sup>5</sup> TCID <sub>50</sub> /mL	Negative	Positive
Parainfluenza	Type 4b	Isolate	1 x 10 <sup>5.53</sup> U/mL	Negative	Positive
Enterovirus	Type 68	Isolate	1 x 10 <sup>5.5</sup> U/mL	Negative	Positive
Human Metapneumovirus	A1 (IA10-s003)	Isolate	1 x 10 <sup>5.55</sup> U/mL	Negative	Positive
Respiratory Syncytial Virus	Type A (3/2015 Isolate #3)	Isolate	1 x 10 <sup>5.62</sup> U/mL	Negative	Positive
Human Rhinovirus	N/A	Inactivated virus	Not available	Negative	Positive
<i>Chlamydophila pneumoniae</i>	AR-39	Isolate	2.9 x 10 <sup>6</sup> IFU/mL	Negative	Positive
<i>Haemophilus influenzae</i>	Type b; Eagan	Isolate	7.87 x 10 <sup>6</sup> cfu/mL	Negative	Positive
<i>Legionella pneumophila</i>	Philadelphia	Isolate	6.82 x 10 <sup>6</sup> cfu/mL	Negative	Positive
<i>Streptococcus pneumoniae</i>	Z022; 19f	Isolate	2.26 x 10 <sup>6</sup> cfu/mL	Negative	Positive
<i>Bordetella pertussis</i>	A639	Isolate	6.37 x 10 <sup>6</sup> cfu/mL	Negative	Positive
<i>Pneumocystis jirovecii</i> - <i>S. cerevisiae</i> Recombinant	W303-Pji	Isolate	1.56 x 10 <sup>6</sup> cfu/mL	Negative	Positive

\*Coronavirus HKU1 was not tested for cross-reactivity due to lack of availability. Given that the 19 specimens in the clinical evaluation that were positive for this strain all resulted as negative, cross-reactivity wet testing was not required.

\*\*Testing was performed in triplicate.

Based on the data generated by this study, the organisms or viruses tested Sofia SARS Antigen FIA do not cross-react or interfere.

**c) Hook Effect:**

As part of the LoD study the highest concentration of heat-inactivated SARS-CoV-2 stock available (TCID<sub>50</sub> of 3.40 x10<sup>5</sup> per mL) was tested. There was no Hook effect detected.

**d) Endogenous Interference Substances Studies:**

A study was performed demonstrate that fourteen (14) potentially interfering substances that may be found in the upper respiratory tract do not cross-react or interfere with the detection of SARS-CoV-2 in the Sofia SARS Antigen FIA Assay.

Interfering Substance	Active Ingredient	Concentration	Cross-Reactive Results*	Interference Results*
Afrin – nasal spray	Oxymetazoline	5%	Negative	Positive
Blood (human)	Blood	5%	Negative	Positive
Chloraseptic, Cepacol	Benzocaine, Menthol	0.7 g/mL	Negative	Positive
Flonase	Fluticasone	5%	Negative	Positive
Halls Relief Cherry Flavor	Menthol	0.8 g/mL	Negative	Positive

Interfering Substance	Active Ingredient	Concentration	Cross-Reactive Results*	Interference Results*
Nasocort Allergy 24 hour	Triamcinolone	5.00%	Negative	Positive
Neo-Syneprine	Phenylephrine hydrochloride	5%	Negative	Positive
Oseltamivir	Oseltamivir	2.2 µg/mL	Negative	Positive
Purified mucin protein	Mucin protein	2.5 mg/mL	Negative	Positive
Rhinocort	Budesonide (Glucocorticoid)	5%	Negative	Positive
Saline nasal spray	Saline	15%	Negative	Positive
Tobramycin	Tobramycin	1.25 mg/mL	Negative	Positive
Zanamivir	Zanamivir	282.0 ng/mL	Negative	Positive
Zicam Cold Remedy	Galphimia glauca, Luffa operculata, Sabadilla	5%	Negative	Positive

\* Testing was performed in triplicate.

Based on the data generated by this study, the substances tested Sofia SARS Antigen FIA do not cross-react or interfere.

#### ASSISTANCE

For questions regarding the use of this product or to report a product problem, please contact Quidel Technical Support at 1.800.874.1517 (in the U.S.) or [technicalsupport@quidel.com](mailto:technicalsupport@quidel.com). If outside the U.S., contact your local distributor or one of the Technical Support Centers listed below. You may also contact us at [quidel.com](http://quidel.com).

Country	Phone	E-Mail Address
Europe, Middle East and Africa	+353 (91) 412 474 (main) 0 1800 200441 (toll free)	<a href="mailto:emeatechnicalsupport@quidel.com">emeatechnicalsupport@quidel.com</a>
Austria	+43 316 231239	
Belgium	+32 (2) 793 0180	
France	0 (805) 371674	
Germany	+49 (0) 7154 1593912	
Netherlands	0 800 0224198	
Switzerland	0 800 554864	
United Kingdom	0 800 3688248	
Ireland	+353 (91) 412 474	
Italy	+39 (800) 620 549	
North America, Asia-Pacific, Latin America	858.552.1100	<a href="mailto:technicalsupport@quidel.com">technicalsupport@quidel.com</a>
Canada	437.266.1704 (main) 888.415.8764 (toll free)	<a href="mailto:technicalsupport@quidel.com">technicalsupport@quidel.com</a>
China	0400 920 9366 or +86 021 3217 8300	<a href="mailto:chinatechnicalservice@quidel.com">chinatechnicalservice@quidel.com</a>

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**IVD**



MDSS GmbH  
Schiffgraben 41  
30175 Hannover,  
Germany



**Quidel Corporation**  
10165 McKellar Court  
San Diego, CA 92121 USA  
[quidel.com](http://quidel.com)

Swab



MDD 93/42/EEC



Emergo Europe  
Prinsessegracht 20, 2514 AP  
The Hague, The Netherlands



Puritan Medical Products Company LLC  
31 School Street  
Guilford, Maine 04443-0149 USA

1451903EN00 (06/21)

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**REF**

Catalogue number



CE mark of conformity

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**EC REP**

Authorized representative in the European Community

**LOT**

Batch code

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Use-by date



Manufacturer

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Temperature limit

**R<sub>x</sub> ONLY**

Prescription use only in the United States

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Consult instructions for use

**IVD**

*In vitro* diagnostic medical device

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Contains sufficient for <n> tests

**CONTROL +**

Positive control

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**CONTROL -**

Negative control

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