QUIDEL

Sofia®
hCG FIA

FOR USE WITH SOFIA ONLY
CLIA Complexity: MODERATE

INTENDED USE

The Sofia hCG FIA is an immunofluorescence-based lateral flow assay intended for the qualitative detection of human Chorionic Gonadotropin (hCG) in **urine** specimens and is designed to aid early detection of pregnancy.

The test is intended for prescription use only, including use at point-of-care sites.

SUMMARY AND EXPLANATION

Human Chorionic Gonadotropin is a hormone produced by the placenta shortly after implantation. Since hCG is present in the urine of pregnant women, it is an excellent marker for confirming pregnancy.

PRINCIPLE OF THE TEST

The Sofia hCG FIA is an immunofluorescence-based lateral flow test for use with the Sofia analyzer (Sofia). The test uses a pair of monoclonal murine antibodies specific to the beta subunit of hCG to capture and detect hCG. The beta subunit was chosen to ensure specificity as the alpha subunit is nearly identical to the alpha subunit found in LH, FSH and TSH.

To perform the test, a urine specimen is collected and dispensed into the Sample Well on the test Cassette. The Cassette is placed inside of Sofia for an automatically defined development time. Sofia then scans the test strip and analyzes the fluorescent signal, using method-specific algorithms. Sofia then displays the test result (Positive, Negative, or Invalid) on the screen, and optionally prints the results on an integrated printer.

REAGENTS AND MATERIALS SUPPLIED

50-Test Kit:

- Individually Packaged Cassettes (50): Mouse monoclonal anti-hCG antibodies
- Fixed Volume Pipettes (50)
- Package Insert (1)
- Quick Reference Instructions (1)
- QC Card (located on kit box)
- Printer Paper (1)

MATERIALS REQUIRED BUT NOT SUPPLIED IN KIT

- Specimen collection containers
- Sofia analyzer
- Calibration Cassette (supplied with the Sofia Installation Pack)
- External hCG urine controls

WARNINGS AND PRECAUTIONS

- For *in vitro* diagnostic use.
- 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.[1]
- Use of Nitrile or Latex (or equivalent) gloves is recommended when handling patient samples.
- Dispose of containers and used contents in accordance with Federal, State and Local requirements.
- Do not reuse the used Cassette or Fixed Volume Pipettes.
- The user should never open the foil pouch of the test Cassette exposing it to the ambient environment until the Cassette is ready for immediate use.
- Discard and do not use any damaged Cassette.
- To obtain accurate results, the Package Insert instructions must be followed.
- The Sofia hCG FIA will automatically be forced into the WALK AWAY Mode when inserted into Sofia. DO NOT allow the test Cassette to develop on the bench or counter top prior to placing the Cassette into Sofia.
- The Calibration Cassette must be kept in the provided storage pouch between uses.
- Inadequate or inappropriate specimen collection, storage, and transport may yield false test results.
- Do not write on the barcode of the Cassette. This is used by Sofia to identify the type of test being run and to identify the individual Cassette so as to prevent a second read of the Cassette by the same Sofia.
- As the detection reagent is a fluorescent compound, no visible results will form on the test strip. Sofia must be used for result interpretation.

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 Cassette: Sofia Calibration Check procedure, built-in procedural control features, and External Controls.

Sofia Calibration Check Procedure

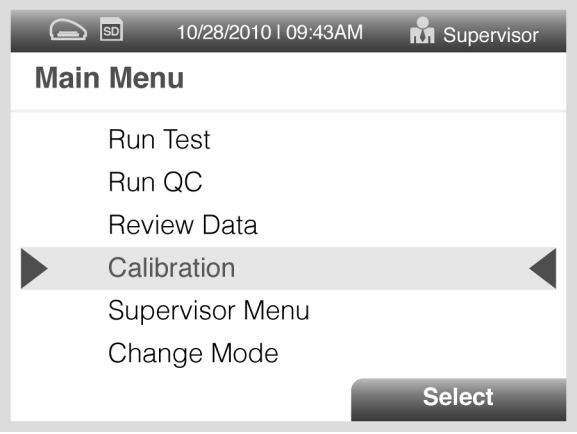
Note: This is a "Calibration Check" procedure.

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

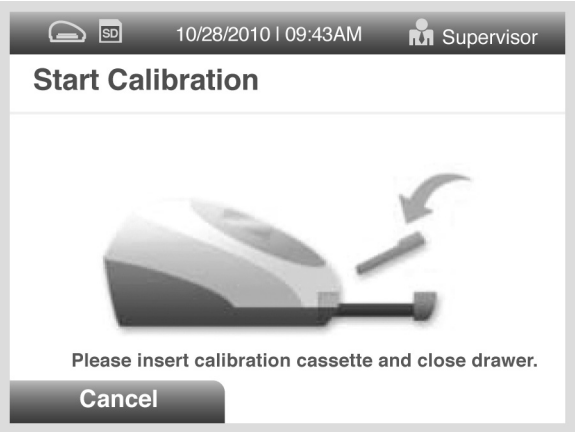
The Calibration Check is a required function that checks the Sofia optics and calculation systems using a specific Calibration Cassette. This Calibration Cassette is shipped with the Sofia Installation Pack. Refer to the Sofia User Manual for details regarding the Calibration Check Procedure.

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

1. To check the calibration of Sofia, select "Calibration" from the Main Menu.



2. Following the prompts, insert the Calibration Cassette into Sofia and close the drawer. Sofia performs the calibration check automatically with no user input required.



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

NOTE: If calibration cannot be completed successfully, notify the on-site Supervisor or contact Quidel Technical Support for assistance 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; custserv@quidel.com (Customer Service); technicalsupport@quidel.com (Technical Support) or contact your local distributor.

Built-in Procedural Control

The Sofia hCG FIA test strip contains a built-in procedural control feature. Each time a test is run, Sofia scans this part of the test strip, and the result is displayed on the Sofia screen as "valid" or "invalid."

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

A valid result obtained with this procedural control demonstrates that the test flowed correctly and the functional integrity of the Cassette was maintained. The procedural control is interpreted by Sofia simultaneously with the end of the assay. If the test does not flow correctly, Sofia will indicate that the result is invalid. Should this occur, review the procedure and repeat the test with a new test Cassette.

External Quality Control

External controls are used to demonstrate that the reagents and assay procedure perform properly. It is recommended that controls be tested once for each new lot, new shipment of kits, and as deemed additionally necessary by your internal quality control procedures, and in accordance with Local, State and Federal regulations or accreditation requirements. For information on how to obtain external controls, contact Quidel Technical Support.

To test external controls, the user must first select Run QC on the main Menu of Sofia. 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. Sofia will then prompt the user to run the external controls. **The positive control test must be run prior to the negative control test.** Follow the instructions per the Sofia User Manual and the external control set. When preparing the test Cassettes, ensure approximately 120 µL of the control solution is added to the Cassette sample well.

When the QC test is complete, each result will be displayed as "Passed" or "Failed" 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 specimens.

SPECIMEN COLLECTION AND HANDLING

Collect a urine specimen in a clean container. First morning specimens generally contain the highest concentrations of hCG and are recommended for early detection of pregnancy. However, any urine sample is suitable for testing.

If testing will not be performed immediately, the specimens may be kept at room temperature (15°C to 30°C) or refrigerated (2°C to 8°C) for up to 72 hours. For prolonged storage, specimens may be frozen once at –20°C or below. Frozen samples stored at –80°C may be transported overnight on dry ice. If frozen, mix samples after thawing. **Ensure that specimens are at room temperature before beginning the assay.**

TEST PROCEDURE

DO NOT open the foil pouch containing the test Cassette until ready to test the specimen. Place the test Cassette on a clean and level surface.

Urine specimens must be at room temperature before beginning the assay.

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.*

Refer to the Sofia User Manual for operating instructions.

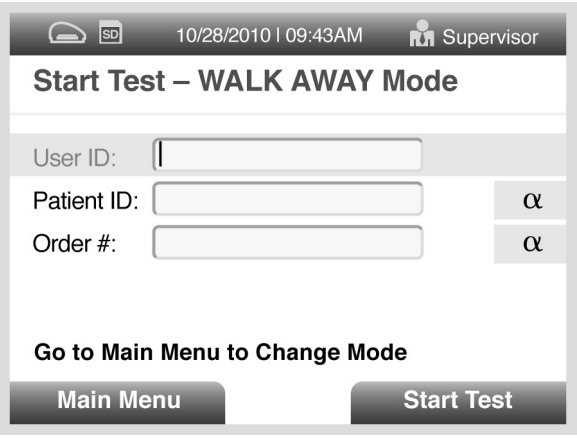
Using Sofia: Forced WALK AWAY Mode

The Sofia hCG FIA will automatically be run in the WALK AWAY Mode in Sofia. Once a prepared test Cassette is inserted into the Sofia drawer and the drawer closed (Step 7 of the Test Procedure), Sofia will be forced into WALK AWAY Mode. **Do not allow the Cassette to develop on the bench or counter top prior to placing the Cassette into Sofia.**

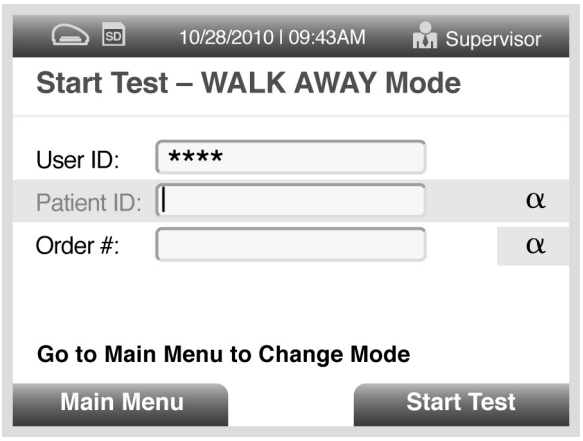
Part 1: Set Up Sofia

1. Select "Run Test" from the main menu on Sofia.
2. Input the User ID using the barcode scanner or manually enter the data using the key pad.

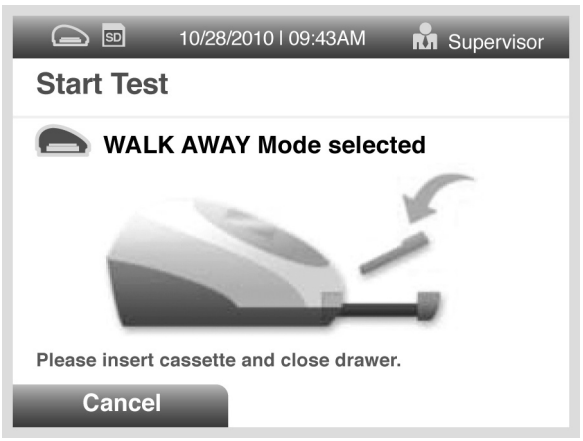
   NOTE: If you mistakenly scan the incorrect barcode, use the Arrow Buttons on the Sofia key pad to re-highlight the field. Then simply rescan using the correct barcode, and the previous one will be overwritten with the correct barcode.



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



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



Part 2: Prepare the test Cassette

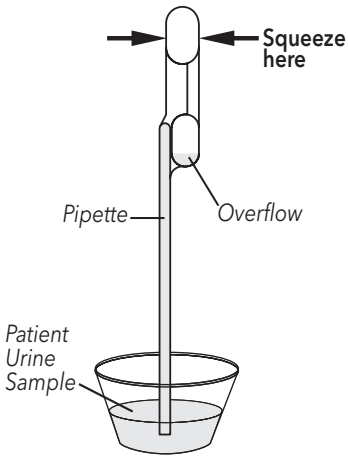
5. Fill the provided Fixed Volume Pipette (120 µL) with the patient sample from the specimen collection container.

To fill the Fixed Volume Pipette with the patient sample:

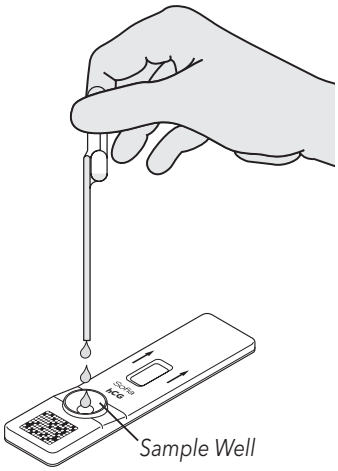
a. FIRMLY squeeze the top bulb.

b. Still squeezing, place the Pipette tip into the patient sample.

c. With the Pipette tip still in the patient sample, release pressure on bulb to fill the Pipette.



6. Firmly squeeze the top bulb to empty the contents of the Fixed Volume Pipette into the Cassette sample well. Extra liquid in the overflow bulb is OK. Do not attempt to dispense it too.



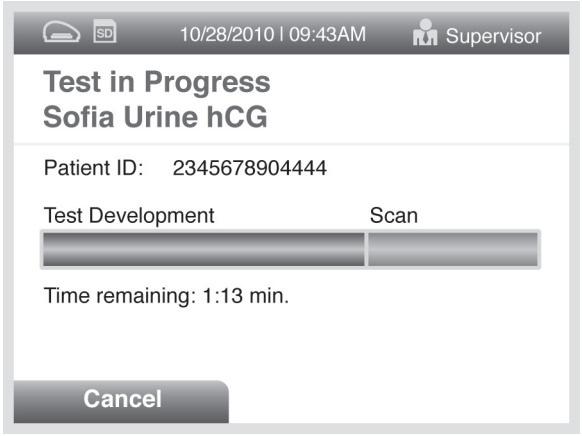
NOTE: The Fixed Volume Pipette is designed to collect and dispense the correct amount of liquid sample. Discard the Pipette in your biohazard waste.

NOTE: Proceed promptly to the next step.

Part 3: Insert the Cassette into Sofia

7. Carefully lift the test Cassette and insert the Cassette into Sofia. **Gently** close the drawer.

8. Sofia will start automatically and display the progress, as shown in the example below. The test results will be displayed on the screen in approximately 3 minutes. See Interpretation of Results section.



For example: This display shows that the test has 1 minute, 13 seconds remaining.

SOFIA'S TIME TO RESULT

After dispensing the patient sample into the Cassette and inserting it into Sofia, Sofia will display the results within about 3 minutes.

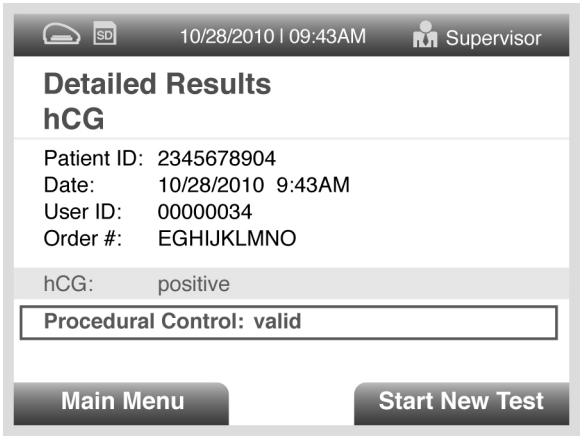
If the Cassette is not immediately inserted into Sofia, a proprietary feature within the Sofia system gives the operator greater flexibility, up to 5 minutes, before placing the Cassette into Sofia.

INTERPRETATION OF RESULTS

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

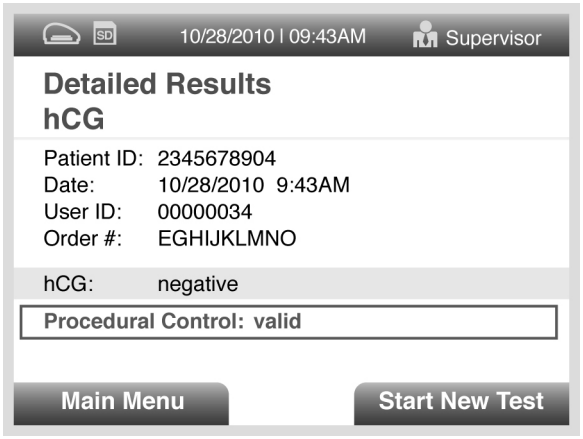
The Sofia screen will display results for the procedural control as being "valid" or "invalid," and will provide a positive or negative result for the detection of hCG. If the procedural control is "invalid," retest the patient's sample with a new Cassette.

Positive Result:



For example: This display shows a valid <u>positive</u> result for hCG.

Negative Result:



For example: This display shows a valid <u>negative</u> result for hCG.

Invalid Result:

For example: This display shows an <u>invalid</u> result.

Note: If the test is invalid, a new test should be performed with a new test Cassette.

LIMITATIONS

- The contents of this kit are to be used for the **qualitative** detection of hCG in urine specimens.
- While pregnancy is the most likely reason for the presence of hCG in urine, elevated hCG concentrations unrelated to pregnancy have been reported in some patients.[2,3] Conditions other than normal pregnancy may be associated with detectable hCG, including, for example, ectopic pregnancy or molar pregnancy.[4]
- hCG may remain detectable for a few days to several weeks after delivery, abortion, natural termination or hCG injections.[5,6]
- Abnormal pregnancies cannot be diagnosed by qualitative hCG results. The above conditions should be ruled out when diagnosing pregnancy.
- If a negative result is obtained but pregnancy is suspected, hCG levels may be too low or urine may be too dilute for detection. Another specimen should be collected after 48-72 hours and tested. If waiting 48 hours is not medically advisable, the test result should be confirmed with a more sensitive quantitative hCG test.
- A negative test result may occur if the level of hCG in a sample is below the clinical threshold of 20 mIU/mL 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.

EXPECTED VALUES

Specimens containing as low as 20 mIU/mL hCG for urine will yield positive results when tested with Sofia hCG FIA. For some patients, an hCG level of 25 mIU/mL can be detected as early as 2-3 days before expected menses.[7]

PERFORMANCE CHARACTERISTICS

Sofia hCG FIA Clinical Performance

A multi-center clinical study was conducted to establish the performance of the Sofia hCG FIA compared to results obtained from another commercially available qualitative test. This study was conducted by health care personnel at five (5) distinct sites in various geographical regions within the United States. In this multi-center, point-of-care (POC) field trial, 974 fresh urine specimens, collected from patients presenting for pregnancy testing, were evaluated. The results are summarized in Table 1 below.

Table 1
Sofia hCG FIA Performance Compared to a Commercially Available Qualitative Test

	Comparator Test	
	Pos	Neg
Sofia Pos	176	2
Sofia Neg	1	795
Total:	177	797

Positive Agreement = >99% (176/177)
(95% CI=97%-100%)
Negative Agreement = >99% (795/797)
(95% CI=99%-100%)
Overall Agreement = >99% (971/974)
(95% CI=99%-100%)

Reproducibility Studies

The reproducibility of the Sofia hCG FIA was evaluated at three (3) different laboratories. Three (3) different operators at each site tested a series of coded, contrived samples, prepared in negative urine, ranging from a low negative to a moderate positive hCG. For each level a total of 90 replicates were tested over 5 different days at each site. The results are shown in Table 2 below. The low negative specimens were called negative 100% (270/270) of the time. When testing the weak negative sample, Sofia reported the samples negative for hCG 92% (249/270) of the time. When testing the weak positive samples, Sofia reported the samples positive 95% (257/270) of the time. When testing the moderate positive samples, Sofia called the samples positive 100% (270/270) of the time. There were no significant differences observed within run, between runs, or between sites. The results are summarized in Table 2 below.

Table 2
Sofia hCG FIA Reproducibility Study

Site	Low Negative (C_0) (5 mIU/mL)	Weak Negative (C_5) (9.5 mIU/mL)	Weak Positive (C_{95}) (16 mIU/mL)	Moderate Positive ($C_{>100}$) (25 mIU/mL)
1	90/90	87/90	84/90	90/90
2	90/90	86/90	84/90	90/90
3	90/90	76/90	89/90	90/90
Total	270/270	249/270	257/270	270/270
% Overall Agreement (95% CI)	**100% (98%-100%)**	**92% (88%-95%)**	**95% (92%-97%)**	**100% (98%-100%)**

Detection Limit

The sensitivity of the Sofia hCG FIA was tested by spiking pooled male urine with varying concentrations (0-100 mIU/mL) of hCG traceable to WHO International 4th Standard. The results are listed in Table 3 below. The positive/negative threshold at which 100% of the samples tested positive was confirmed at 20 mIU/mL hCG.

Table 3
Detection Limit Testing

hCG Conc. (mIU/mL)	Number of Positives	Number of Negatives	Percent Positive
100	10/10	0/10	100%
50	10/10	0/10	100%
30	10/10	0/10	100%
25	60/60	0/60	100%
22.5	60/60	0/60	100%
20	60/60	0/60	100%
17.5	57/60	3/60	95%
15	48/60	12/60	80%
12.5	27/60	33/60	45%
10	5/60	55/60	8.3%
7.5	0/60	60/60	0%
5	0/60	60/60	0%
2.5	0/10	10/10	0%
0	0/10	10/10	0%

Analytical Specificity

The following substances, hormones, and microorganisms listed in Table 4 were tested and did not show interference or cross-reactivity in the assay at the quantities indicated.

Table 4
Analytical Specificity

Substance/Microorganism	Concentration
Chemical Substances	
Acetaminophen	20 mg/dL
Acetoacetic Acid	1,600 mg/dL
Acetylsalicylic Acid	20 mg/dL
Ampicillin	2 mg/dL
Ascorbic Acid	20 mg/dL
Atropine	20 mg/dL
ß-Hydroxybutyrate	2,000 mg/dL
Benzoylecgonine	8 mg/dL
Bovine Serum	10 mg/dL
Caffeine	20 mg/dL
Cannabinol	10 mg/dL
Cellulose	500 mg/dL
Citric Acid	500 mg/dL
Clomiphene	100 mg/dL
Cow's Milk	9 mg/dL
DMSO	0.90%
EDTA	80 mg/dL
Ephedrine	18 mg/dL
Ethanol	0.80%
Gentisic Acid	20 mg/dL
Methanol	0.90%
Phenothiazine	20 mg/dL
Phenylpropanolamine	20 mg/dL
Salicylic Acid	20 mg/dL
Tetracycline	20 mg/dL
Theophylline	20 mg/mL
Uric Acid	18 mg/dL

Substance/Microorganism	Concentration
Urine Substances	
Albumin (serum)	2,000 mg/dL
Bilirubin	1 mg/dL
Glucose	2,000 mg/dL
Haptoglobin	1 mg/dL
Hemoglobin	1 mg/dL
Human Anti-Mouse Antibodies	2.85 ng/mL
Myoglobin	1 mg/dL
Rheumatoid Factor	1.08 IU/mL
Serum (negative human)	1%
Urine Peroxide	10 mg/dL
Urine pH	5-9
Urine Specific Gravity	1.005-1.037
Hormones	
hLH	450 mIU/mL
hFSH	900 mIU/mL
hTSH	1,000 mIU/mL
Estriol 17-beta	28,000 µg/dL
Pregnanediol glucuronide	45,000 µg/dL
ß-core fragment, hCG	5.1×10^5 pmol/L
Microorganisms	
E. coli	2.61×10^8 CFU/mL
Streptococcus agalactiae (Group B)	2.50×10^7 CFU/mL
Chlamydia trachomatis	1.00×10^7 IFU/mL
Candida albicans	1.07×10^7 CFU/mL

ASSISTANCE

If you have any questions regarding the use of this product or if you want to report a test system problem, please call Quidel's Technical Support Number 800.874.1517 (in the U.S.) or 858.552.1100, Monday through Friday, from 7:00 a.m. to 5:00 p.m., Pacific Time. If outside the U.S., contact your local distributor or technicalsupport@quidel.com.

REFERENCES

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REF 20229 – Sofia hCG FIA – 50 Tests
20266 – Sofia hCG FIA – 50 Tests (multi-language)

IVD

CE

EC REP

MDSS GmbH
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30175 Hannover,
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Quidel Corporation
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1241702EN00 (01/14)

EC REP
Authorized Representative
in the European Community

REF
Catalogue number

LOT
Batch code

IVD
For *In Vitro* diagnostic use

Consult instructions for use

Use by

Manufacturer

Temperature limitation