CLIA Waiver by Application Approval Determination

Decision Memorandum

A. Document Number

CW220006

B. Parent Document Number

K221925

C. CLIA Waiver Type:

Dual 510(k) and CLIA Waiver by Application (Dual Submission)

D. Applicant

Abbott Diagnostics Scarborough, Inc.

E. Proprietary and Established Names

ID NOW COVID-19 2.0
ID NOW Instrument

F. Measurand (analyte)

RdRp gene of SARS-CoV-2 RNA.

G. Sample Type(s)

Direct nasal and nasopharyngeal swabs.

H. Type of Test

ID NOW COVID-19 2.0 is a rapid, instrument-based isothermal test for the qualitative detection of viral RNA from SARS-CoV-2 in direct nasal or nasopharyngeal swabs.

I. Test System Description

1. Overview

ID NOW COVID-19 2.0 is a rapid, instrument-based isothermal test for the qualitative detection of viral RNA from SARS-CoV-2 in direct nasal or nasopharyngeal swabs. ID NOW COVID-19 2.0 System utilizes isothermal nucleic acid amplification technology and is comprised of:

- Sample Receiver – single use, disposable containing the elution buffer
- Test Base – single use, disposable comprising two sealed reaction tubes, each containing a lyophilized pellet
- Transfer Cartridge – single use, disposable for transfer of the eluted sample to the Test Base
- Patient Swabs – sterile anterior nasal swabs (foam) for anterior nasal swab collection and for use as a Negative Control
- Positive Control Swab – single use, to ensure that test reagents are working properly and that the test is correctly performed, and
- ID NOW Instrument

The reaction tubes in the Test Base contain lyophilized reagents required for amplification of the target nucleic acid and an internal control. ID NOW COVID-19 2.0 utilizes a pair of templates (similar to primers) for the specific amplification of RNA from SARS-CoV-2 and a fluorescently labeled molecular beacon designed to specifically identify the amplified nucleic acid targets. ID NOW COVID-19 2.0 is performed within the confinement of the Test Base, and no other part of the ID NOW Instrument has contact with the sample during the amplification process.

To perform the assay, the Sample Receiver and Test Base are inserted into the ID NOW Instrument. The sample is added to the Sample Receiver and transferred via the Transfer Cartridge to the Test Base, resuspending the lyophilized pellets contained within the Test Base and initiating viral lysis and target amplification. Heating, mixing and detection by fluorescence is provided by the instrument, with results automatically reported.

Results are displayed by the ID NOW Instrument and are also stored in an on-board archive and are assigned to a sample ID that has been entered into the ID NOW Instrument by the operator either manually or using barcode scanner. Data can be retrieved and downloaded by the operator at any time after testing. An external Universal Printer can be attached via USB to the ID NOW Instrument to print test results.

2. Test System Components

- Sample Receiver (24 pieces/kit)
- Test Base (24 pieces/kit)
- Transfer Cartridge (24 pieces/kit)
- Sterile Patient Swabs (24 swabs/kit) for anterior nasal swab collection and for use as Negative Control Swab
- Positive Control Swab (1 swab/kit)
- ID NOW Instrument
- Package Insert (1)
- Quick Reference Instructions (1)
- Nasopharyngeal Swabs (required but not provided)

If additional Positive or Negative Control Swabs are required, ID NOW COVID-19 2.0 Control Swab Kit can be purchased separately. ID NOW COVID-19 2.0 Control Swab Kit contains 12 Positive Control Swabs and 12 sterile swabs for use as negative controls.

J. Demonstrating "Simple"

ID NOW COVID-19 2.0 System was designed to be simple and easy to use by incorporating the following features:

- ID NOW COVID-19 2.0 test components are provided as a "self-contained" test (test kit with unitized reagents). The test kit contains all of the components required to perform the test, and is comprised of:
    - Sample Receiver – single use, disposable, containing the elution buffer
    - Test Base – single use, disposable, comprising two sealed reaction tubes, each containing a lyophilized pellet
    - Transfer Cartridge – single use, disposable, for transfer of the eluted sample to the Test Base, and
    - Sterile Patient Swabs for anterior nasal swab collection and for use as Negative Control Swab
    - Positive Control Swab
    - ID NOW Instrument –required to perform the test, a fully automated instrument, provided separately.

  To perform the assay, the Sample Receiver and Test Base are inserted into the ID NOW Instrument. All steps of the assay process are timed by the instrument; no timing by the test operator is required. When prompted by the instrument, the swab sample is added to the Sample Receiver and mixed by swirling motion for 10 seconds, then discarded. The Transfer Cartridge is pressed onto the Sample Receiver and the sample is then transferred via the Transfer Cartridge to the Test Base, resuspending the lyophilized pellet contained within the Test Base and initiating target amplification. No further operator intervention is required. The subsequent heating, mixing, and detection by fluorescence is performed by the instrument, with results automatically reported.

- The test uses direct unprocessed specimens. The sample used in the test system is a nasal or nasopharyngeal swab, tested directly. Following collection, the swab is inserted in the Sample Receiver containing the elution buffer. The swab is removed and discarded. When prompted by the instrument, the sample is transferred to the Test Base using the Transfer Cartridge. All remaining assay steps are performed by the ID NOW Instrument.

- The test system does not require any reagent manipulation as all reagents are contained within the test components.

- The test does not require any operator intervention during the analysis step. After the sample is added to the Sample Receiver and transferred via the Transfer Cartridge to the Test Base, all subsequent steps, such as heating, mixing and detection by fluorescence, are executed by the instrument.

- The operators of the test device do not require any technical or specialized training with respect to troubleshooting or interpretation of results. The results are displayed on the instrument screen as "Positive," "Negative," or "Invalid." Error messages are clearly displayed on the ID NOW Instrument screen, with additional information provided in the ID NOW Instrument User Manual.

- ID NOW Instrument requires no electronic or mechanical maintenance. ID NOW Instrument contains no serviceable parts and is to be returned to Abbott Diagnostics Scarborough, Inc. for repair.

- The Quick Reference Instructions (QRI) included in the test kit is written at no higher than a 7th grade reading level. The Quick Start Guide included with the ID NOW Instrument, is primarily a pictorial representation of initial unpacking and set-up instructions.

K. Demonstrating "Insignificant Risk of an Erroneous Result"- Failure Alerts and Fail-safe Mechanisms

1. Risk Analysis

   A comprehensive risk analysis of the ID NOW COVID-19 2.0 run on the ID NOW Instrument has been conducted in accordance with ISO 14971:2019. The sponsor utilized the Device Hazard Analysis and the Failure Mode Effects Analysis (FMEA) methods to assess the risks of failure that may occur during use or misuse of the device. The FMEA includes identification of potential failure modes and effect of the failure, potential causes, built in design controls and evaluation of severity, frequency of occurrence, and ability to detect the failure. The elements considered included operator errors (human factors), sample and device handling and storage, and environmental factors.

   Potential sources of errors that could adversely affect system performance were identified and mitigated first through system design and then through additional cautions in the labeling. The identified risks which could result in erroneous test results were evaluated in flex studies that stressed the functional limits of the test system (see below).

   The sponsor provided detailed software validation and verification documentation, including requirements related to assay performance when using the ID NOW Instrument. The instrument software was reviewed under the parent 510(k) submission (K221925). The ID NOW Instrument on which ID NOW COVID-19 2.0 is run, has previously been cleared under 510(k) K141520 (Alere i Influenza A & B).

2. Fail-Safe and Failure Alert Mechanisms

   ID NOW COVID-19 2.0 run on the ID NOW Instrument was designed to include numerous features and fail-safe mechanisms built into the system to prevent erroneous results.

   Design Features

a. Test components are packaged in sealed aluminum pouches to ensure product stability.

b. The Sample Receiver and Test Base components are color coded and shaped only to fit into the proper location on the instrument and only in the proper orientation.

c. The Test Base contains a quick response (QR) code with information such as test type, expiration date, and lot number. Image analysis by the instrument reads the QR code and generates an error message if an expired Test Base is used. Upon confirmation of the Test Base insertion, the user is instructed to insert the Sample Receiver.

d. ID NOW Instrument detects the insertion of the Sample Receiver into the Sample Receiver holder and automatically instructs the user to insert and mix the sample in the elution buffer and transfer the sample to the Test Base using the Transfer Cartridge.

e. The instrument uses image analysis to confirm the Transfer Cartridge is present and instructs the user to close the lid before testing can begin. The lid operates using a magnetic switch that detects lid closure and automatically begins the testing process when the lid is closed.

f. The instrument software implements temperature control of both the Test Base and the Sample Receiver holders (heater blocks). Each of the heater blocks is managed independently with high precision temperature monitoring and control. Over temperature protection is assured by the following mechanisms:

   - The heater subsystem incorporates a software independent, over temperature protection circuit hardware.

   - The heater subsystem incorporates a local over temperature non-resetting thermal fuse in direct contact with the heater block.

g. If power is lost during a test run, the test is cancelled, and a result is not reported.

h. Additional software controls are implemented to ensure control of the testing process, i.e., all parameters of the testing process are within specifications. The instrument performs a self-test upon initial startup and before each test is run. If the self-test fails, an error is displayed, and the user is not able to proceed with sample testing. A description of the specific errors/warnings generated is provided in the ID NOW Instrument user manual.

Built-in Procedural Control

ID NOW COVID-19 2.0 contains a built-in procedural control. The control tests for sample inhibition, amplification, and assay reagent function. The result of the procedural control is displayed on the screen and is automatically stored in the instrument memory with each test result. “Procedural Control Valid” displayed on the instrument screen

indicates that the assay reagents maintained their functional integrity and the sample did not significantly inhibit assay performance.

External Controls

ID NOW COVID-19 2.0 External Controls are designed for use with ID NOW COVID-19 2.0. The Positive Control swab is coated with inactivated SARS-CoV-2 virus dried onto a swab. This control confirms that the sample elution and lysis and workflow were performed correctly, and the ID NOW Instrument and kit components are performing as expected. A blank patient swab contained within the test kit can be used as the Negative Control Swab.

The labeling contains a Quick Reference Instructions (QRI) which is written in simple language and contains graphics to facilitate comprehension of the directions.

3. Flex Studies

Operational limits of the device were tested in the following series of experiments:

1. Variation in mixing of the swab.
2. Performing ID NOW COVID-19 2.0 testing outside of the temperature and humidity ranges specified in the ID NOW Instrument User Manual.
3. Use of an ID NOW Strep A 2 Sample Receiver in place of an ID NOW COVID-19 2.0 Sample Receiver.
4. Use of a Sample Receiver that had been spilled or overfilled during manufacture.
5. Variation in the amount of time each assay step is completed, prior to Instrument timeout.
6. User does not transfer correct amount of sample to the Test Base.
7. ID NOW COVID-19 2.0 test kit experiences freezing and thawing that may occur during shipment to the customer.
8. User does not allow test components to reach room temperature before testing.
9. Use of a Sample Receiver whose foil seal was removed before the warm-up period is complete.
10. Use of a Sample Receiver that had been removed and then reinserted in the Instrument during warm up.
11. Performing multiple dispenses of the same sample on ID NOW COVID-19 2.0.
12. ID NOW COVID-19 2.0 test kits are exposed to elevated temperatures for a short period of time, as may occur during shipping.

Detailed descriptions of the flex studies are presented below. The experiments were set up as follows: On each day of testing, ID NOW COVID-19 2.0 positive control swab (n=1) and blank swab serving as the negative control (n=1) were tested on each instrument. Positive swab samples were prepared using inactivated SARS-CoV-2 at 34.8 copies/reaction (~1.74x LoD) diluted in Universal Transport Media (UTM). Elution Buffer only was tested as the negative sample (except in flex study 4, where UTM was used instead). For each condition evaluated, samples were tested in 5 replicates (unless otherwise indicated). The strain used for testing was 2019-nCoV/USA-WA1/2020.

Flex Study 1 – Incomplete Mixing/Extraction of the Sample

The test procedure instructs the user to mix the swab for 10 seconds. The objective of this study was to evaluate the effect on test performance when other swab mixing methods are used. The following swab mixing methods were evaluated:

- Swab was dipped in and out of the elution buffer (no mixing or eluting).
- Swab gently mixed in Elution Buffer for 5 seconds and DID NOT press the swab against the side of the Sample Receiver to remove liquid.
- Swab gently mixed in Elution Buffer for 10 seconds and DID NOT press the swab against the side of the Sample Receiver to remove liquid.

- Swab gently mixed in Elution Buffer for 10 seconds and pressed the swab against the side of the Sample Receiver to remove liquid (control condition).
- Swab gently mixed in Elution Buffer for 20 seconds and pressed the swab against the side of the Sample Receiver to remove liquid.

Expected results were obtained for all swab mixing methods evaluated. The results of this study demonstrate that there is an insignificant risk of incorrect results when the test operator does not follow product instructions and does not sufficiently mix the sample in the Elution Buffer.

Flex Study 2 – Kit Temperature and Humidity Exposure

The labeling for ID NOW COVID-19 2.0 specifies the intended test operating environment as 15°C to 30°C and 10% to 80% relative humidity (RH) (non-condensing). The objective of this study was to evaluate the effects on test performance if ID NOW COVID-19 2.0 is performed outside of the temperature and humidity ranges specified in the labeling. The Environmental Flex Conditions evaluated in this study were set up as follows in an Environmental Chamber:

- Control Condition (standard laboratory environment, approximately 15°C-30°C and 10- 80% RH)
- 12°C / 83-94% RH (<15°C/>80% RH)
- 12°C / 4-7% RH (<15°C/<10% RH)
- 31°C / 83-94% RH (>30°C/>80% RH)
- 31°C / 4-7% RH (>30°C/<10% RH)

ID NOW COVID-19 2.0 test procedure instructs the user to leave test pieces sealed in their foil pouches until just before use. The following conditions were tested for each Environmental Flex Condition:

- Disposables were stored in their pouches in the environment for at least 60 minutes. Disposables were removed from their pouches and used immediately.
- Disposables were removed from their pouches and were exposed to the environmental conditions for at least 60 minutes prior to use.

The positive samples across all conditions during study execution generated 49 out of 50 positive results (one false negative result at 31°C / 83% to 94% RH most likely due to an operator or pipetting error). All other environmental conditions for each disposable configuration yielded expected results. The study results indicate that the performance of ID NOW COVID-19 2.0 is not affected when pouched and un-pouched disposables are exposed to the tested elevated temperature and humidity conditions and left unpouched for up to 60 minutes before testing.

Flex Study 3 – Sample Receiver Handling: Use of Incorrect Sample Receiver
The objective of this study was to evaluate the effect on test performance when an ID NOW Strep A 2 Sample Receiver is used with an ID NOW COVID-19 2.0 Test Base. It was not necessary to evaluate ID NOW Influenza A & B 2 and ID NOW RSV Sample Receivers as ID NOW COVID-19 2.0 elution buffer is manufactured with the same components, by the same process and to the same specifications as the ID NOW Influenza A & B 2 and ID NOW RSV elution buffer. The following variations were evaluated:

- For the experimental control, samples were tested with ID NOW COVID-19 2.0 Sample Receivers and Test Bases.
- For the experimental condition, samples were tested with ID NOW Strep A 2 Sample Receivers and ID NOW COVID-19 2.0 Test Bases.

Expected results were obtained for all conditions evaluated. The results of this study demonstrate that ID NOW COVID-19 2.0 does not generate false negative, false positive, or invalid results when samples near the limit of detection are tested with an ID NOW Strep A 2 Sample Receiver and an ID NOW COVID-19 2.0 Test Base. To further mitigate potential risk of erroneous results, the foil seal of the Sample Receiver is printed with the test name which is visible to the operator when handling the components.

Flex Study 4 – Sample Receiver Handling: Elution Buffer Spill or Overflow
The objective of this study was to evaluate the effects on test performance when using Sample Receivers with low volume of Elution Buffer (due to accidental spilling) or high volume of Elution Buffer (due to inadvertent overfilling during manufacture). All samples were tested at n=5 replicates with six volumes of Elution Buffer being evaluated: 0.5, 1.0, 1.5, 2.0, 2.5 (control condition), and 3.0 ml.

Expected results were obtained for all conditions evaluated except for the fill volume of 0.5mL (1 negative and 3 invalid results). The results of this study demonstrate that ID NOW COVID-19 2.0 yields valid and expected results with Elution Buffer volumes between 1.0 mL and 3.0 mL present in the Sample Receiver. Invalid or false results may be generated when 0.5 mL of Elution Buffer is present in the Sample Receiver.

To further mitigate this risk, the following precaution is included in the Product Insert: "If the liquid within the Sample Receiver is spilled while opening, clean the instrument per instructions provided in the ID NOW Instrument User Manual and cancel the test. Repeat test with a new Sample Receiver."

Flex Study 5 – User Timing of Test Steps
Four steps of the ID NOW COVID-19 2.0 test procedure will time out after a set amount of time. The objective of this study was to evaluate the effects on test performance when each step of the ID NOW COVID- 19 2.0 test procedure was delayed to the end of the time out period but executed before the instrument timed out.

The procedure below was followed by the operator. Control condition testing was performed according to the test procedure by performing each step immediately when

prompted by the instrument. Under Flex condition, the operator waited the maximum amount of time allowed by the instrument for each of the 4 timed steps in the test procedure:

Time Out Condition	Time Out Start Trigger	Time Out Stop Trigger	Max Time Allowed
A: Test Base inserted, Sample Receiver not inserted	Camera detects bar code on Test Base	Sample Receiver detected by sensor	3 minutes (180 seconds)
B: Sample Receiver detected; sample not added	Sample receiver detected by sensor	OK button pushed by user	8 minutes (480 seconds)
C: Sample added to Sample Receiver, but eluate not transferred to Test Base with Transfer Cartridge	OK button pushed by user	Camera detects Transfer Cartridge	2 minutes (120 seconds)
D: Sample transferred to Test Base with Transfer Cartridge but Lid not closed	Camera detects Transfer Cartridge	Lid closed	30 seconds

All results were as expected for each condition tested when ID NOW COVID-19 2.0 was run with the maximum allowable time delays between each step, as controlled by the instrument timeouts. The results of this study demonstrate that ID NOW COVID-19 2.0 yields valid and expected results when the assay is executed using the maximum allowable time between each timed step.

Flex Study 6 – Elution Buffer Transfer Volume

The Transfer Cartridge is designed to transfer 100 µL sample volume to each of the test tubes located in the Test Base. The objective of this study was to evaluate the effects on test performance if the Transfer Cartridge doesn't deliver the expected 100 µL ±10 µL sample volume to the Test Base during the sample transfer step of the test procedure.

Different transfer volumes were evaluated [70 µL, 80 µL, 90 µL, 100 µL (control), 110 µL, 120 µL and 130 µL]. Expected results were obtained for all experimental transfer volumes and the control condition. The results of this study demonstrate that ID NOW COVID-19 2.0 test performance is not likely to be impacted when sample volumes of 70 – 130 µL are delivered to each tube present in the Test Base.

Flex Study 7 – Test Kit Freeze/Thaw

ID NOW COVID-19 2.0 Package Insert instructs the user to store the test kit at 2-30°C. The objective of this study was to evaluate the effects on test performance when test kit components (Test Base, Sample Receiver, Transfer Cartridge) are subjected to one or three freeze/thaw cycles prior to relocation to maximum customer storage conditions (30°C) that may occur due to inadvertent freezing of the kit components during shipment to the customer.

Kit components stored at normal storage conditions (2-30°C) were evaluated as the control condition. The following Freeze/Thaw Cycles were evaluated as experimental conditions.

One Freeze/Thaw Cycle:

- Kit components were placed at -20°C for a minimum of 24 hours. After the minimum 24 hours at -20°C, the kit components were transferred to a 30°C incubator for a minimum of 24 hours. After the minimum 24 hours at 30°C, the sample receivers were shaken to confirm that the contents were thawed.
- Kits were immediately tested as Time 0.
- Additional kits remained stored at 30°C until testing at later timepoints (Month 7 and Month 13).

Three Freeze/Thaw Cycles:

- Kit components were placed at -20°C for a minimum of 24 hours. After the minimum 24 hours at -20°C, the kit components were transferred to a 30°C incubator for a minimum of 24 hours. After the minimum 24 hours at 30°C, the sample receivers were shaken to confirm that the contents were thawed.
- Kit components were then exposed to two additional freeze/thaw cycles.
- Following the third freeze/thaw cycle, kits were immediately tested as Time 0.
- Additional kits remained stored at 30°C until testing at later timepoints (Month 7 and Month 13).

All samples were tested in replicates of n=33 at Time 0. The study was extended to ensure kit components which have undergone one and three freeze/thaw cycles remained stable after 7 months and 13 months of storage. Additional testing was performed with replicates of n=10 at Month 7 and Month 13. All tests generated 100% agreement with expected results for all replicates at all time points (except for two invalid results at Time 0). Overall, the results of this study demonstrate that ID NOW COVID-19 2.0 test performance is not impacted when kit components are exposed to one or three freeze/thaw cycles.

Flex Study 8 – Assay Component/Test Kit In Use Temperature

ID NOW COVID-19 2.0 Package Insert instructs the user to allow all test components to reach room temperature prior to use. The objective of this study was to evaluate the effects on test performance when test components are not allowed to reach room temperature before performing ID NOW COVID-19 2.0. The following test conditions were evaluated:

- Pouched Sample Receivers, Test Bases, and Transfer Cartridges were stored at 2-8°C for between 19 and 22 hours, removed and tested immediately.
- Pouched Sample Receivers, Test Bases, and Transfer Cartridges were stored at 2-8°C for between 19 and 22 hours, removed and allowed to equilibrate to room temperature for 30 minutes and tested (control condition).

Expected results were obtained for each condition evaluated. The results of this study demonstrate that ID NOW COVID-19 2.0 yields valid and expected results when test components are removed from storage and tested directly without allowing the test components to reach room temperature.

Flex Study 9 – Early Removal of Sample Receiver Foil

Per ID NOW COVID-19 2.0 Package Insert instructions and prompts on the Instrument screen, the user needs to remove the foil seal after the Sample Receiver has warmed up. The objective of this study was to evaluate the effect on test performance when the foil seal is removed from the Sample Receiver before the Sample Receiver is warmed up.

Steps of the ID NOW COVID-19 2.0 test procedure were followed until insertion of the Sample Receiver. The following test conditions were evaluated:

- The Sample Receiver was inserted into the ID NOW Instrument and the foil seal was removed from the Sample Receiver immediately. Testing then proceeded according to the test procedure.
- The Sample Receiver was inserted into the ID NOW Instrument and the foil seal was removed from the Sample Receiver after 1 minute. Testing then proceeded according to the test procedure.
- The Sample Receiver was inserted into the ID NOW Instrument and the foil seal was removed from the Sample Receiver after 2 minutes. Testing then proceeded according to the test procedure.
- Control condition testing was done by following the ID NOW COVID-19 2.0 test procedure without any deviations (i.e., following Instrument screen prompts). Under control condition, the warm-up cycle is three (3) minutes.

Expected results were obtained for each condition evaluated. The results of this study demonstrate that ID NOW COVID-19 2.0 yields valid and expected results when the foil seal is removed from the Sample Receiver early, prior to completion of the warm-up and before prompted by the instrument.

Flex Study 10 – Sample Receiver Handling – Sample Receiver Not Fully Inserted or Removed From the Instrument

Per ID NOW COVID-19 2.0 test instructions, the user should gently insert the blue Sample Receiver into the blue Sample Receiver holder and wait for the Sample Receiver to warm up. The Sample Receiver should not be removed from the instrument once warm up begins. The objective of this study was to verify the performance of ID NOW COVID-19 2.0 when the Sample Receiver is not fully inserted in the Sample Receiver holder of the ID NOW Instrument, but the Sample Receiver is detected by the instrument sensor, thereby initiating the Sample Receiver warm up process and testing sequence. This study also verified the performance of ID NOW COVID-19 2.0 when the operator removes the Sample Receiver from the instrument after the warm-up period is complete but before adding the sample. The following conditions were evaluated:

- Control Condition: Steps of the ID NOW COVID-19 2.0 test procedure were followed. Sample Receiver was inserted into the Sample Receiver holder until the sensor triggered a countdown for the Sample Receiver warm-up cycle.

- Experimental Condition 1 - Sample Receiver not fully inserted into the Sample Receiver Holder: Steps of the ID NOW COVID-19 2.0 test procedure were

followed until insertion of the Sample Receiver. The Sample Receiver was positioned 1 – 2 mm and angled above the Sample Receiver holder, stopping when the instrument recognized it, and before the Sample Receiver was fully seated.

- Experimental Condition 2 – Sample Receiver removed from the ID NOW Instrument: Steps of the ID NOW COVID-19 2.0 test procedure were followed until insertion of the Sample Receiver. When prompted by the instrument's Graphical User Interface (GUI) screen, Sample Receiver was inserted and fully seated into the Sample Receiver holder of the ID NOW Instrument. After the warm-up was complete, the Sample Receiver was removed from the ID NOW Instrument and replaced with a new Sample Receiver taken directly from 2-8°C storage. The new Sample Receiver was not allowed to warm up and the operator proceeded immediately with adding the sample to elution buffer.

Expected results were obtained for each condition evaluated. The results of this study demonstrate that ID NOW COVID-19 2.0 yields valid and expected results when the Sample Receiver is not fully seated in the Sample Receiver holder of the ID NOW Instrument and when the Sample Receiver is removed after warm-up and replaced with a new Sample Receiver from 2-8°C storage.

Flex Study 11 – Multiple Dispenses of the Same Sample

The objective of this study was to verify if there is an impact when testing multiple dispenses of the same sample on ID NOW COVID-19 2.0. The study evaluated the ability to re-test a sample when an invalid result is obtained while testing on ID NOW COVID-19 2.0. ID NOW COVID-19 2.0 Product Insert states "if an invalid result is received, one additional test may immediately be run using the same Sample Receiver". In this study, the same Sample Receiver was used for three successive runs with 30 minutes wait time between each run, to provide additional data in case an end user does not immediately run a new test once an invalid result is received.

For each replicate tested (n=5), the following steps were taken to perform three sequential ID NOW COVID-19 2.0 tests using the same sample receiver:

- Step 1: A first test was run, and steps of the ID NOW COVID-19 2.0 procedure were followed. A 30 minute timer was started after the first test was completed, i.e., when the results were displayed on the GUI screen.
- Step 2: Test Base/Transfer Cartridge assembly was attached to an open, unused Sample Receiver and the assembled part was discarded.
- Step 3: The original Sample Receiver (used to run the first test) was lifted out of the instrument, was retained and kept upright to avoid spilling the liquid contents. The ID NOW Instrument lid was then closed to allow the Instrument to self-test.
- Step 4: After 30 minutes, a second test was initiated from the Home Screen and a new COVID-19 2.0 Test Base was inserted.
- Step 5: The screen prompts are followed; when asked to insert the Sample Receiver, the original Sample Receiver was reinserted. When prompted to

"remove the foil seal and place the swab to be tested into the sample receiver" this step was skipped by pressing the OK button on the GUI screen.
- Step 6: A new Transfer Cartridge was pressed into the Sample Receiver and then connected to the Test Base. The instrument lid was closed to allow running of the assay and display of the results.
- A 30 minute timer was started after the second test was completed, i.e., when the results were displayed on the GUI screen.
- To run the third test, steps 2-6 above were repeated.
- After the completion of the third test run, the standard test procedure was followed to dispose of the used test components.

Expected results were obtained for all three runs with each replicate. The study result demonstrates that three ID NOW COVID-19 2.0 tests could be performed using multiple dispenses of the same sample from the sample receiver.

Flex Study 12 – Test Kit Temperature Stress

ID NOW COVID-19 2.0 Package Insert instructs the user to store the test kit at 2-30°C. The objective of this study was to evaluate the effects on test performance when test components (Test Base, Sample Receiver, Transfer Cartridge and positive control swab) are subjected to short term storage at an increased temperature that may occur during shipment to the customer. The following conditions were tested:

- Reference: Kit components labeled "Reference" were stored at ambient conditions (15-30°C) until Time 0 testing.
- 7 Day Temperature Stress: Kit components labeled "7 Day Temperature Stress" were stored at 45°C for 7 days until Time 0 testing.
- 14 Day Temperature Stress: Kit components labeled "14 Day Temperature Stress" were stored at 45°C for 14 days until Time 0 testing.
- After Time 0 testing, all kit components including the "Reference" labeled were placed at 30°C for long term storage to support testing through expiry of the assay.

SARS-CoV-2 positive swab (34.8 copies/reaction), kit positive control swab (137.6 copies/reaction) and blank patient swabs were tested with the kit components at Time=0 (post condition, n=33) and at Time=7 months (n=10). For each condition evaluated, 100% agreement with expected results for all replicates was obtained. This data demonstrates that exposure of the kits to temperature of 45°C for up to 14 days, which may occur during shipment, does not affect the performance of the ID NOW COVID-19 2.0 after seven (7) months of room temperature (30°C) storage.

L. Demonstrating "Insignificant Risk of an Erroneous Result" –Accuracy

Clinical Performance

The clinical performance of the ID NOW COVID-19 2.0 was established in a multi-center, prospective clinical study conducted at 21 US study sites between 2020 and 2021. A total of 60 operators, across the 21 clinical sites, tested subjects with ID NOW COVID-19 2.0. The study sites and the test operators used in this clinical study were representative of CLIA waived settings that ID NOW COVID-19 2.0 is intended for.

To be enrolled in the study, patients had to be presenting at the participating study centers showing signs and symptoms of upper respiratory infection. Two nasal (NS) or nasopharyngeal (NPS) swabs were collected from each patient and tested using ID NOW COVID-19 2.0 at all study sites. Three (3) FDA Emergency Use Authorized real-time Polymerase Chain Reaction (RT-PCR) assays for the detection of SARS-CoV-2 were utilized in a composite comparator method to establish a composite comparator result for this study. At all sites, one nasal or nasopharyngeal swab was tested directly with ID NOW COVID-19 2.0 according to product instructions and the other swab was eluted in UTM. All sites shipped the UTM sample to a central testing laboratory for RT-PCR testing with the comparator assays.

a. Testing Sites and Operators

   The 21 clinical sites participating in the study represented CLIA waived testing locations and included emergency rooms, outpatient clinics, and a nursing & rehabilitation center. A total of 60 operators performed the testing with ID NOW COVID-19 2.0 using ID NOW Instruments.

   The operators were healthcare professionals with no formal training or experience in laboratory testing and included registered nurses, clinical study coordinators, medical assistants and research assistants. Information on the operators' current job title, education, laboratory experience and the number of years of relevant work experience was provided. The education of the operators ranged from high school graduates to postgraduate degrees. Test operators were given the Quick Reference Instructions (QRI) and a draft Product Insert (PI). No other materials or instructions were provided, and the operators received no training on the use of the test.

b. Study Specimens

   A total of 1044 symptomatic subjects were enrolled, out of which 130 were excluded due to patient eligibility, sample handling or testing specification issues. The remaining 914 specimens were used to establish the performance of ID NOW COVID-19 2.0 which included 460 anterior nasal (NS) and 454 nasopharyngeal (NPS) swab specimens.

c. Assay Performance

The performance of ID NOW COVID-19 2.0 with ID NOW Instrument, when used by operators representative of those in CLIA waived settings, was evaluated against three FDA Emergency Use Authorized SARS-CoV-2 RT-PCR assays using a composite comparator method. Results obtained from the 914 specimens (454 NPS and 460 NS specimen) were used in data analysis. The performance of the assay, when in the hands of untrained operators, is presented below as positive percent agreement (PPA) and negative percent agreement (NPA) with the composite comparator result.

ID NOW COVID-19 2.0 Performance against Composite Comparator (Nasal and Nasopharyngeal Swabs Combined)

	Composite Comparator Result		
ID NOW COVID-19 2.0	**POSITIVE**	**NEGATIVE**	**Total**
Positive	254	10	264
Negative	23	627	650
Total	277	637	914
PPA (95% CI)	91.7% (87.8% - 94.4%)		
NPA (95% CI)	98.4% (97.1% - 99.1%)		

Device Performance with Analyte Concentrations Near the Cutoff

A reproducibility and samples near the cut-off study of ID NOW COVID-19 2.0 was conducted by nine operators at three sites over five different days using panels of four SARS-CoV-2 samples contrived in clinical matrix. All of the operators were representative of the intended users at CLIA waived sites having no training or hands-on experience in conducting laboratory testing. At each site, three (3) operators tested eight (8) samples (2 replicates of each of the 4 Sample Panel Members) with three (3) lots of Test Bases and three (3) lots of Sample Receiver/Transfer Cartridges on each testing day. Samples were tested in random order. Each operator conducted testing for a minimum of 5 days. Testing days spanned a 10-day time period. No operator tested on 5 consecutive days. If a sample had an initial invalid result, the operator retested the sample once with the same lot and instrument. Each operator tested one positive and one negative control swab on each instrument used for the study, on each day of testing prior to performing the study testing. External control swabs were tested once per day on each instrument.

The percent agreement with the expected results is shown in the table below. The data generated in this study demonstrates that ID NOW COVID-19 2.0 is reproducible when testing is conducted by intended users (i.e., untrained operators) in CLIA waived settings. There were no significant differences observed within run (replicates tested by one operator), between run (five

different days), between sites (three sites), or between operators (nine operators), or lots (three lots).

Reproducibility Study – Overall Agreement with Expected Results Across All Sites, Operators, and Lots

Sample Type		Site			Overall Agreement and 95% CI	
		Site 1	Site 2	Site 3		
1.16x LoD	Percent Agreement	97.8%	94.4%	96.7%	96.3% (260/270)	93.3%, 98.0%
	Count	88/90	85/90	87/90		
1.74x LoD	Percent Agreement	98.9%	96.6%	98.9%	98.1% (263/268)	95.7%, 99.2%
	Count	89/90	86/89[2]	88/89[2]		
0.0235x LoD (High Negative)	Percent Agreement	87.8%	90.9%	90.0%	89.6% (240/268)	85.3%, 92.7%
	Count	79/90	80/88[2]	81/90		
Virus Free Negative[1]	Percent Agreement	100.0%	100.0%	98.9%	99.6% (267/268)	97.9%, 99.9%
	Count	90/90	89/89[2]	88/89[2]		
Positive Control	Percent Agreement	100%	100%	100%	100% (137/137)	97.3% - 100.0%
	Count	45/45	46/46	46/46		
Negative Control	Percent Agreement	100%	100%	100%	100% (137/137)	97.3% - 100.0%
	Count	45/45	46/46	46/46		

[1]Percent Agreement correlates to the percent of negative results.
[2]Sample(s) excluded due to protocol deviation.

Quick Reference Instructions (QRI)

The QRI for the use of ID NOW COVID-19 2.0 with ID NOW Instrument is written in simple language (at 7th grade reading level) and contains pictorial descriptions of the individual steps. In addition to the test procedure for patient specimens, the QRI includes a section on performing QC testing with external controls. A section on specimen collection and handling is also included in the QRI.

Operator Questionnaire Results:

Upon completion of the prospective clinical study and the reproducibility study, the operators at each site were asked to complete a questionnaire to help assess whether the participants understood how to use ID NOW COVID-19 2.0 with ID NOW Instrument correctly. The questionnaire consisted of a series of questions pertaining to the ease of use of the test with answers rated on a scale of agreeability (strongly agree, agree, neutral, disagree, and strongly disagree). Fifty seven operators completed the questionnaire. The participants found the test to be easy to use and the instructions easy to understand.

M. Labeling for Waived Devices

The labeling consists of:

a) ID NOW COVID-19 2.0 Package Insert,
b) ID NOW COVID-19 2.0 Quick Reference Instructions (QRI),
c) ID NOW Instrument User Manual, and
d) Kit Box and Pouch Labels

The following elements are appropriately present:

- The Quick Reference Instructions are written at no higher than a 7th grade reading level and, where appropriate, contain graphic representation of system components and procedure steps.

- The Package Insert and the QRI identify the test as CLIA waived, and contain a statement that a Certificate of Waiver is required to perform the test in a waived setting; information on how users can obtain a certificate is also provided.

- The Package Insert and the QRI contain a statement that laboratories with a Certificate of Waiver must follow the manufacturer's instructions for performing the test. 42 CFR 493.15(e)(1).

- Instructions for quality control (QC) are integrated with the procedural instructions for performing the test in both the Package Insert and the QRI.

- Appropriate cautions have been added to the Package Insert and Quick Reference Instructions to ensure safe use of the product.

- The labeling is sufficient, and it satisfies the requirements of 21 CFR Part 809.10.

N. Conclusion:

The submitted information in this CLIA waiver application supports a CLIA waiver approval decision.