 **Proc# 4840-CH-500**

ARCHITECT SARS-CoV-2 IgG

**SARS-CoV-2 IgG**

**Serum or Plasma**

**ABBOTT ARCHITECT**

**For use under an Emergency Use Authorization (EAU) Only**

**Intended Use**

The SARS-CoV-2 IgG assay is a chemiluminescent microparticle immunoassay (CMIA) used for the qualitative detection of IgG antibodies to SARS-CoV-2 in human serum and plasma on the ARCHITECT i System.

# Clinical Significance

The SARS-CoV-2 IgG assay is a CMIA on the ARCHITECT i System. The assay is designed to detect IgG antibodies to the nucleocapsid protein of SARS-CoV-2 in serum and plasma from patients with signs and symptoms of infection who are suspected of coronavirus disease (COVID-19) or in serum and plasma of subjects that may have been infected by SARS-CoV-2.

# Principle

This assay is an automated, two-step immunoassay for the qualitative detection of IgG antibodies to SARS-CoV-2 in human serum and plasma using chemiluminescent microparticle immunoassay (CMIA) technology.

Sample, SARS-CoV-2 antigen coated paramagnetic microparticles, and assay diluent are combined and incubated. The IgG antibodies to SARS-CoV-2 present in the sample bind to the SARS-CoV-2 antigen coated microparticles. The mixture is washed. Anti-human IgG acridinium-labeled conjugate is added to create a reaction mixture and incubated. Following a wash cycle, Pre-Trigger and Trigger Solutions are added.

The resulting chemiluminescent reaction is measured as a relative light unit (RLU). There is a direct relationship between the amount of IgG antibodies to SARS-CoV-2 in the sample and the RLU detected by the system optics. This relationship is reflected in the calculated index (S/C).

The presence or absence of IgG antibodies to SARS-CoV-2 in the sample is determined by comparing the chemiluminescent RLU in the reaction to the calibrator RLU.

For additional information on system and assay technology, refer to the ARCHITECT System operations Manual, Section 3.

# Specimen Collection and Handling

# Specimen Types

The specimen types listed below may be used with this assay.

##  Specimen Types Collection Tubes

 Serum Serum

 Plasma EDTA

* Performance has not been established for the use of cadaveric specimens or the use of bodily fluids other than human serum/ plasma.
* Liquid anticoagulants may have a dilution effect resulting in lower Index (S/C) values for individual specimens.

The instrument does not provide the capability to verify specimen types. It is the responsibility of the operator to verify that the correct specimen types are used in the assay.

## Specimen Conditions

* Do not use:
	+ heat-inactivated specimens
	+ pooled specimens
	+ grossly hemolyzed specimens
	+ specimens with obvious microbial contamination
	+ specimens with fungal growth
* For accurate results, serum and plasma specimens should be free of fibrin, red blood cells, and other particulate matter. Serum specimens from patients receiving anticoagulant or thrombolytic therapy may contain fibrin due to incomplete clot formation.
* To prevent cross contamination, use of disposable pipettes or pipette tips is recommended.

## Preparation for Analysis

* Follow the tube manufacturer’s processing instructions for collection tubes. Gravity separation is not sufficient for specimen preparation.
* Specimens should be free of bubbles. Remove bubbles with an applicator stick before analysis.

Use a new applicator stick for each specimen to prevent cross contamination.

To ensure consistency in results, re-centrifuge specimens prior to testing if

* they contain fibrin, red blood cells, or other particulate matter. NOTE: If fibrin, red blood cells, or other particulate matter are observed, mix by low speed vortex or by inverting 10 times prior to re-centrifugation.

Prepare frozen specimens as follows:

* Frozen specimens must be completely thawed before mixing.
* Mix thawed specimens thoroughly by low speed vortex or by inverting 10 times.
* Visually inspect the specimens. If layering or stratification is observed, mix until specimens are visibly homogeneous. If specimens are not mixed thoroughly, inconsistent results may be obtained.Recentrifuge specimens. Recentrifugation of SpecimensTransfer specimens to a centrifuge tube and centrifuge.
* Transfer clarified specimen to a sample cup or secondary tube for testing. For centrifuged specimens with a lipid layer, transfer only the clarified specimen and not the lipemic material.

## Storage



If testing will be delayed more than 7 days, store frozen (-20°C or colder). Frozen specimens subjected to up to 2 freeze/thaw cycles have been evaluated.

## Specimen Shipping

Package and label specimens in compliance with applicable state, federal, and international regulations covering the transport of clinical specimens and infectious substances.

Do not exceed the storage limitations listed above.

# Materials and Equipment Required

**TEST INSTRUMENT**: Abbott ARCHITECT System

## Materials Provided

06R86 SARS-CoV-2 IgG Reagent Kit

## Materials Required but not Provided

* SARS-CoV-2 IgG assay file found on [www.corelaboratory.abbott](http://www.corelaboratory.abbott/)
* 06R8601 SARS-CoV-2 IgG Calibrator Kit
* 06R8610 SARS-CoV-2 IgG Control Kit or other control material containing IgG antibodies to SARS-CoV-2
* ARCHITECT Pre-Trigger Solution
* ARCHITECT Trigger Solution
* ARCHITECT Wash Buffer
* ARCHITECT Septum

For information on materials required for operation of the instrument, refer to the ARCHITECT System Operations Manual, Section 1.

For information on materials required for maintenance procedures, refer to the ARCHITECT System Operations Manual, Section 9.

# Reagent Handling and Storage:

## Warnings and Precautions

* For *In Vitro* Use

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## Safety Precautions

**CAUTION:** This product requires the handling of human specimens. It is recommended that all human-sourced materials and all consumables contaminated with potentially infectious materials be considered potentially infectious and handled in accordance with the OSHA Standard on Bloodborne Pathogens. Biosafety Level 2

or other appropriate regional, national, and institutional biosafety practices should be used for materials that contain, are suspected of containing, or are contaminated with infectious agents.1-4

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| The following warnings and precautions apply to: Microparticles and Diluent |
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| **WARNING** | Contains methylisothiazolone and sodium azide. |
| H317 | May cause an allergic skin reaction. |
| EUH032 | Contact with acids liberates very toxic gas. |
| **Prevention** |
| P261 | Avoid breathing mist / vapors / spray. |
| P272 | Contaminated work clothing should not be allowed out of the workplace. |

|  |  |
| --- | --- |
| P280 | Wear protective gloves / protective clothing / eye protection. |
| **Response** |
| P302+P352 | IF ON SKIN: Wash with plenty of water. |
| P333+P313 | If skin irritation or rash occurs: Get medical advice / attention. |
| P362+P364 | Take off contaminated clothing and wash it before reuse. |
| **Disposal** |
| P501 | Dispose of contents / container in accordance with local regulations. |

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| The following warnings and precautions apply to: Conjugate |
| H402 | Harmful to aquatic life. |
| H412 | Harmful to aquatic life with long lasting effects. |
| **Prevention** |
| P273 | Avoid release to the environment. |
| **Disposal** |
| P501 | Dispose of contents / container in accordance with local regulations. |

Follow local chemical disposal regulations based on your location along with recommendations and content in the Safety Data Sheet to determine the safe disposal of this product.

For the most current hazard information, see the product Safety Data Sheet.

Safety Data Sheets are available at [www.corelaboratory.abbott](http://www.corelaboratory.abbott/) or contact your local representative. For a detailed discussion of safety precautions during system operation, refer to the ARCHITECT System Operations Manual, Section 8.

## Reagent Handling

* Reagents are shipped on wet ice.
* Do not pool reagents within a kit or between kits.
* Before loading the reagent kit on the system for the first time, the microparticle bottle requires mixing to resuspend microparticles that may have settled during shipment. For microparticle mixing instructions, refer to the PROCEDURE, Assay Procedure section of this package insert.

## Septums MUST be used to prevent reagent evaporation and contamination and to ensure reagent integrity. Reliability of assay results cannot be guaranteed if septums are not used according to the instructions in this package insert.

* + To avoid contamination, wear clean gloves when placing a septum on an uncapped reagent bottle.
	+ Once a septum has been placed on an open reagent bottle, do not invert the bottle as this will result in reagent leakage and may compromise assay results.
	+ Over time, residual liquids may dry on the septum surface. These are typically dried salts and

have no effect on assay efficacy.

* When handling conjugate vials, change gloves that have contacted human serum or plasma, since introduction of human IgG will result in a neutralized conjugate.

For a detailed discussion of reagent handling precautions during system operation, refer to the ARCHITECT System Operations Manual, Section 7.

## Reagent Storage

* Do not freeze.
* Protect from light.
* Unopened 2-8° good until expiration date.
* On-board stability 7 days
* Opened but stored upright at 2-8° in the refrigerator with a septum and cap good until expiration date.
* Reagents may be stored on or off the ARCHITECT iSystem. If reagents are removed from the system, store them at 2-8°C (with septums and replacement caps) in an upright position. For reagents stored off the system, it is recommended that they be stored in their original trays and boxes to ensure they remain upright. **If the microparticle bottle does not remain upright (with a septum installed) while in refrigerated storage off the system, the reagent kit must be discarded.** For information on unloading reagents, refer to the ARCHITECT System Operations Manual, Section 5.

## Reagents



**Calibration**

Each assay control must be tested to evaluate the assay calibration. Once a calibration is accepted and stored, all subsequent samples may be tested without further calibration unless:

* + A reagent kit with a new lot number is used.
	+ Daily quality control results are outside of quality control limits used to monitor and control system performance.

This assay may require recalibration after maintenance to critical parts or subsystems or after service procedures have been performed.

## Calibrator Required:

SARS-CoV-2 IgG calibrator 06R8601



## Standardization:

There is currently no internationally recognized reference method or reference material for standardization. The SARS-CoV-2 IgG calibrator is traceable to internal reference standards.

## Calibrator Preparation:

Thaw completely before use.

Prior to each use, mix by gentle inversion.

## Calibration Procedure:

* + - Test the calibrator in replicates of 3. The calibrator should be priority loaded.
		- To obtain the recommended volume requirements for the calibrator, hold the bottle vertically, and dispense 4 drops of the calibrator into the sample cup in the assigned position.
		- For information on ordering calibrations, refer to the ARCHITECT System Operations Manual, Section 6.

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## Troubleshooting and Overall Acceptance Criteria Failure

See ARCHITECT Operations Manual for further calibration troubleshooting.

# Quality Control:

The recommended control requirement for the SARS-CoV-2 IgG assay is that a single sample of each control level be tested once every 24 hours each day of use.

Additional controls may be tested in accordance with local, state, and/or federal regulations or

accreditation requirements and your laboratory’s quality control policy.

Refer to published guidelines for information or general control recommendation, for example Clinical and Laboratory Standards Institute (CLSI) Guideline C24, 4th ed., or other published guidelines, for general quality control recommendations.5

* + If more frequent control monitoring is required, follow the established quality control procedures for your laboratory.
	+ If quality control results do not meet the acceptance criteria defined by your laboratory, sample results may be suspect. Follow the established quality control procedures for your laboratory. Recalibration may be necessary. For troubleshooting information, refer to the ARCHITECT System Operations Manual, Section 10.

## Controls Required:

SARS-CoV-2 IgG control 06R8610



## Standardization:

There is currently no internationally recognized reference method or reference material for standardization. The SARS-CoV-2 IgG controls are traceable to internal reference standards.

## Control Preparation:

* + - Thaw completely before use.
		- Prior to each use, mix by gentle inversion.

## Control Procedure:

* + - To obtain the recommended volume requirements for the controls, hold the bottle vertically, and dispense 4 drops of the negative control and 4 drops of the positive control into each sample cup in the assigned position.
		- For information on configuring control data, refer to the ARCHITECT System Operations Manual, Section 2.
		- For instructions on ordering and loading controls on the instrument, refer to the ARCHITECT System Operations Manual, Section 5.

# Instrument Procedure

The ARCHITECT SARS-CoV-2 IgG assay file must be installed on the ARCHITECT iSystem prior to performing the assay.

For detailed information on assay file installation and viewing and editing assay parameters, refer to the

ARCHITECT System Operations Manual, Section 2.

For information on printing assay parameters, refer to the ARCHITECT System Operations Manual, Section 5.

For a detailed description of system procedures, refer to the ARCHITECT System Operations Manual.

# Assay Procedure

For a detailed description of how to run an assay, refer to the ARCHITECT System Operations Manual, Section 5.

* + If using primary or aliquot tubes, refer to the ARCHITECT System Operations Manual, Section 5 to ensure sufficient specimen is present.
	+ Minimum sample cup volume is calculated by the system and printed on the Order List report. To minimize the effects of evaporation, verify adequate sample cup volume is present prior to running the test.
	+ When loading the reagents on the reagent carousel or reagent carrier, the conjugate must be placed in the inner ring (yellow), the microparticles must be placed in the middle ring (pink), and the assay diluent must be placed in the outer ring (green).
	+ Before loading the reagent kit on the system for the first time, the microparticle bottle requires mixing to resuspend microparticles that may have settled during shipment. After the first time the microparticles have been loaded, no further mixing is required.

## Invert the microparticle bottle 30 times.

* Visually inspect the bottle to ensure microparticles are resuspended. If microparticles are still adhered to the bottle, continue to invert the bottle until the microparticles have been completely resuspended.

## If the microparticles do not resuspend, DO NOT USE. Contact your local Abbott

**representative.**

* Once the microparticles have been resuspended, place a septum on the bottle. For instructions about placing septums on bottles, refer to the Reagent Handling section of this package insert.
	+ Maximum number of replicates sampled from the same sample cup: 10
* Priority:
	+ Sample volume for first test: 75 µL
	+ Sample volume for each additional test from same sample cup: 25 µL
* Routine:
	+ Sample volume for first test: 150 µL
	+ Sample volume for each additional test from same sample cup: 25 µL
	+ For general operating procedures, refer to the ARCHITECT System Operations Manual, Section 5.
	+ For optimal performance, it is important to perform routine maintenance as described in the ARCHITECT System Operations Manual, Section 9. Perform maintenance more frequently when required by laboratory procedures.

## In order to prevent potential interactions, perform maintenance prior to and following the batching of SARS-CoV-2 IgG samples.

* **ARCHITECT i2000SR instrument: Perform Daily Maintenance (Operations Manual, 6041 *Daily Maintenance Procedure*)**
* **ARCHITECT i1000SR instrument: Perform Weekly Maintenance Procedure (Operations Manual, 6445 *Pipettor/WZ Probe Cleaning Maintenance Procedure***

# Results

The ARCHITECT i System calculates the calibrator mean chemiluminescent signal from 3 calibrator replicates and stores the result. Results are reported by dividing the sample result by the stored calibrator result. The default result unit for the SARS-CoV-2 IgG assay is Index (S/C).

# Interpretation of Results

**WARNING:**

## This test has not been reviewed by the FDA.

* + - **Negative results do not rule out SARS-CoV-2 infection, particularly in those who have been in contact with the virus. Follow-up testing with a molecular diagnostic should be considered to rule out infection in these individuals.**
		- **Results from antibody testing should not be used as the sole basis to diagnose or exclude SARS-CoV-2 infection or to inform infection status.**
		- **Positive results may be due to past or present infection with non-SARS-CoV-2 coronavirus strains, such as coronavirus HKU1, NL63, OC43, or 229E.**
		- **Not for the screening of donated blood.**

The cutoff is 1.4 Index (S/C).

As with all analyte determinations, the result should be used in conjunction with information available from clinical evaluation and other diagnostic procedures.



# Reporting of Results

Results should be reported per laboratory policy, but should include the following:

Per FDA *Policy for Diagnostic Tests for Coronavirus Disease-2019 during the Public Health Emergency; Immediately in Effect Guidance for Clinical Laboratories, Commercial Manufacturers, and Food and Drug Administration Staff* document issued March 16, 2020, Section IV.D:

“...information along the lines of the following is included in the test reports:

* + This test has not been reviewed by the FDA.
	+ Negative results do not rule out SARS-CoV-2 infection, particularly in those who have been in contact with the virus. Follow-up testing with a molecular diagnostic should be considered to rule out infection in these individuals.
	+ Results from antibody testing should not be used as the sole basis to diagnose or exclude SARS- CoV-2 infection or to inform infection status.
	+ Positive results may be due to past or present infection with

non-SARS-CoV-2 coronavirus strains, such as coronavirus HKU1, NL63, OC43, or 229E.”

* + Not for the screening of donated blood.

# Flags

Some results may contain information in the Flags field. For a description of the flags that may appear in this field, refer to the ARCHITECT System Operations Manual, Section 5.

# Limitations of the Procedure

## WARNING: This test has not been reviewed by the FDA. Refer to the RESULTS, Interpretation of Results section of this package insert for additional restrictions on the results obtained from this assay.

* + - This test is for clinical laboratory use only. It is not for home use.
		- Not for the screening of donated blood.
		- Results should be used in conjunction with other data; e.g., symptoms, results of other tests, and clinical impressions.
		- Immunocompromised patients who have COVID-19 may have a delayed antibody response and

produce levels of antibody which may not be detected as positive by the assay.

* + - Potentially interfering disease states and other cross reactants have been evaluated and are represented in the SPECIFIC PERFORMANCE CHARACTERISTICS section of the reagent package insert.
		- Specimens from patients who have received preparations of mouse monoclonal antibodies for

diagnosis or therapy may contain human anti-mouse antibodies (HAMA). Such specimens may show either falsely elevated or depressed values when tested with assay kits such as SARS-CoV- 2 IgG that employ mouse monoclonal antibodies.

* + - Heterophilic antibodies in human serum can react with reagent immunoglobulins, interfering with

*in vitro* immunoassays. Patients routinely exposed to animals or to animal serum products can be prone to this interference, and anomalous values may be observed.

* + - Rheumatoid factor (RF) in human serum can react with reagent immunoglobulins, interfering with *in vitro* immunoassays.

# Specific Performance Characteristics

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## Sample Dilution Procedures

Dilution of samples for the SARS-CoV-2 IgG assay has not been verified.

## Precision

Within-Laboratory Precision

Testing was conducted using 1 lot of the SARS-CoV-2 IgG Reagent Kit, 1 lot of the SARS-CoV-2 IgG Calibrator Kit, and 1 lot of the SARS-CoV-2 IgG Control Kit and 1 instrument. Two controls were assayed in a minimum of 10 replicates at 2 separate times per day on 4 different days.



## Positive Patient Agreement

To estimate the positive percent agreement (PPA), 122 serum and plasma specimens were collected at different times from 31 subjects who tested positive for SARS-CoV-2 by a polymerase chain reaction (PCR) method and who also presented with COVID-19 symptoms.

Each specimen was tested using the SARS-CoV-2 IgG assay. The PPA and the 95% confidence interval (CI) were calculated.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Days Post-Symptom Onset** | **n** | **Positive** | **Negative** | **PPA (95% CI)** |
| < 3 | 5 | 0 | 5 | 0.00% |
| (0.00, 52.18) |
| 3 - 7 | 10 | 5 | 5 | 50.00% |
| (18.71, 81.29) |
| 8 - 13 | 34 | 31 | 3 | 91.18% |
| (76.32, 98.14) |
| **≥ 14** | **73** | **73** | **0** | **100.00%** |

## Negative Patient Agreement

To estimate the negative percent agreement (NPA), 1070 serum and plasma specimens from subjects assumed to be negative for SARS-CoV-2 were tested. Of the 1070 specimens, 997 specimens were collected prior to September 2019 (pre-COVID-19 outbreak). An additional 73 specimens were collected in 2020 from subjects who were exhibiting signs of respiratory illness but tested negative for SARS-CoV-2 by a PCR method. All 1070 specimens were tested using the SARS-CoV-2 IgG assay. The NPA and the 95% CI were calculated.



## References:

1. ABBOTT ARCHITECT SARS-CoV-2 IgG package insert Abbott Laboratories

Diagnostics Division Abbott Park, IL 60064 April 2020 G90418R01

**2.** ABBOTT ARCHITECT SARS-CoV-2 IgG Calibrator package insert Abbott Laboratories

Diagnostics Division Abbott Park, IL 60064

1. ABBOTT ARCHITECT SARS-CoV-2 IgG Controls package insert

Abbott Laboratories Diagnostics Division Abbott Park, IL 60064

1. Abbott ARCHITECT Operator’s Guide