

## VIDAS<sup>®</sup> SARS-COV-2 IgM



**For prescription use only  
For in vitro diagnostic use only**

**For use under an Emergency Use Authorization (EUA) only.**

**Samples should be collected from individuals within 15 days to 43 days post symptom onset. Samples should not be tested less than 15 days post symptom onset. Negative samples collected before 15 days post symptom onset should be reflexed to direct detection of the virus. Negative samples collected 15 days or more post-symptom onset should be reflexed to a test that detects and reports SARS-CoV-2 IgG.**

### INTENDED USE

The VIDAS<sup>®</sup> SARS-COV-2 IgM is an automated assay using the ELFA (Enzyme Linked Fluorescent Assay) technique intended for qualitative detection of IgM antibodies to SARS-CoV-2 in human serum or plasma (lithium heparin) on instruments of the VIDAS family. The VIDAS<sup>®</sup> SARS-COV-2 IgM is intended for use as an aid in identifying individuals with an adaptive immune response to SARS-CoV-2, indicating recent infection.

At this time, it is unknown for how long antibodies persist following infection and if the presence of antibodies confers protective immunity. The VIDAS<sup>®</sup> SARS-COV-2 IgM should not be used to diagnose acute SARS-CoV-2 infection. Testing is limited to laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C 263a, that meet requirements to perform moderate or high complexity tests.

Results are for the detection of IgM SARS-CoV-2 antibodies. IgM antibodies to SARS-CoV-2 are generally detectable in blood several days after initial infection, although the duration of time antibodies are present post-infection is not well characterized. Individuals may have detectable virus present for several weeks following seroconversion.

Laboratories within the United States and its territories are required to report all positive results to the appropriate public health authorities.

The sensitivity of VIDAS<sup>®</sup> SARS-COV-2 IgM early after infection is unknown.

Negative results do not preclude acute SARS-CoV-2 infection. If acute infection is suspected, direct testing for SARS-CoV-2 is necessary.

False positive results for VIDAS<sup>®</sup> SARS-COV-2 IgM may occur due to cross-reactivity from pre-existing antibodies or other possible causes.

The VIDAS<sup>®</sup> SARS-COV-2 IgM is only for use under the Food and Drug Administration's Emergency Use Authorization.

### SUMMARY AND EXPLANATION

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a Betacoronavirus newly discovered in China in December 2019 which is responsible for an international outbreak of a respiratory illness termed coronavirus disease 19 (COVID-19), and whose manifestations range from a mild, self-limiting respiratory tract illness to severe progressive pneumonia, multiorgan failure, and death.<sup>1</sup>

Serology testing for specific immunoglobulins is an approach to identify individuals previously exposed to SARS-CoV-2.<sup>2</sup> Indeed, most COVID-19 patients had an antibody response at ten days or later after onset of the symptoms.<sup>3</sup> This antibody response is characterized by the early rise of type M immunoglobulins (IgM), then followed by type G immunoglobulins (IgG).<sup>4</sup>

### PRINCIPLE

The assay principle combines a two-step sandwich enzyme immunoassay method with a final fluorescence detection (ELFA).

The single-use Solid Phase Receptacle (SPR) serves as the solid phase as well as the pipetting device. Reagents for the assay are ready-to-use and pre-dispensed in the sealed single-use reagent strips.

All of the assay steps are performed automatically by the instrument. The reaction medium is cycled in and out of the SPR device several times.

After the sample dilution step, the SARS-CoV-2 IgM are captured by recombinant SARS-CoV-2 antigen coated into the interior of the SPR device wall. Unbound components are eliminated during washing steps.

During the second step, the IgM are specifically detected by anti-human IgM labeled with alkaline phosphatase. Unbound components are eliminated during washing steps.

During the final detection step, the substrate (4-Methyl-umbelliferyl phosphate) is cycled in and out of the SPR device. The conjugate enzyme catalyzes the hydrolysis of this substrate into a fluorescent product (4-Methyl-umbelliferone), the fluorescence of which is measured at 450 nm.

At the end of the assay, the results are automatically calculated by the instrument according to the S1 standard stored in memory and a test value is obtained.

The results can then be printed out.

#### CONTENT OF THE KIT (60 TESTS)

60 Strips <sup>(a)</sup> (9COM)	STR	Ready-to-use.
60 Solid Phase Receptacles (9COM) 2 x 30	SPR	Ready-to-use. Interior of SPR device coated with recombinant SARS-CoV-2 antigen (receptor binding domain (RBD) of the Spike SARS-CoV-2 protein).
Standard <sup>(b)</sup> (9COM) 1 x 0.5 mL (liquid)	S1	Ready-to-use. Buffer containing humanized recombinant anti-SARS-CoV-2 IgM antibody + stabilizer of animal origin + preservatives. MLE data indicate the acceptable range in "Relative Fluorescence Value" ("Standard (S1) RFV Range").
Positive control <sup>(b)</sup> (9COM) 1 x 0.5 mL (liquid)	C1	Ready-to-use. Buffer containing humanized recombinant anti-SARS-CoV-2 IgM antibody + stabilizer of animal origin + preservatives. MLE data indicate the acceptable range as an index ("Control C1 (+) Test Value Range").
Negative control <sup>(b)</sup> 1 x 0.5 mL (liquid)	C2	Ready-to-use. Buffer + stabilizer of animal origin + preservatives. MLE data indicate the acceptable range as an index ("Control C2 Test Value Range").
Specifications for the factory master data required to calibrate the assay: MLE barcode printed on the box label.		
1 package insert downloadable from <a href="http://www.biomerieux.com/techlib">www.biomerieux.com/techlib</a>		

The product code (9COM) is unique to the product VIDAS SARS-COV-2 IgM and is composed of an alphanumeric code representing the assay name. This product code enable the instrument to identify the test.



(a) **DANGER**

**WARNING**



EUH208 / H317 / H318 / P261 / P280 / P302 + P352 / P305 + P351 + P338



(b) **WARNING**

EUH208 / H317 / P261 / P280 / P302 + P352

#### Hazardstatements

- EUH208: Contains 2-methyl-4-isothiazolin-3-one hydrochloride. May produce an allergic reaction.
- H317: May cause an allergic skin reaction.
- H318: Causes serious eye damage.

#### Precautionarystatements

- P261: Avoid breathing dust/fume/gas/mist/vapours/spray.
- P280: Wear protective gloves/protective clothing/eye protection/face protection.
- P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
- P305 + P351 + P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

For further information, consult the Safety Data Sheet.

**The SPR device**

SPR devices are identified by the "9COM" code.

Only remove the required number of SPR devices from the pouch and carefully reseal the pouch after opening.

**The Reagent Strip**

The strip consists of 10 wells covered with a labeled foil seal. The label comprises a barcode which mainly indicates the assay code, kit lot number, and expiration date. The foil of the first well is perforated to facilitate the introduction of the sample. The last well of each strip is a cuvette in which the fluorometric reading is performed. The wells in the center section of the strip contain the various reagents required for the assay.

**Description of the 9COM strip**

The strip contains diethanolamine and sodium azide. Refer to the hazard statements "H" and precautionary statements "P" indicated above.<sup>(a)</sup>

Well	Reagents
1	Sample well: dispense 100 µL of standard, control or sample.
2	Sample diluent: buffer + detergent + stabilizer of animal origin + preservative.
3 - 4 - 5	Wash buffer: buffer + detergent + preservative.
6	Conjugate: mouse monoclonal anti-human IgM antibodies conjugated to alkaline phosphatase + stabilizer of animal origin + preservative.
7 - 8	Wash buffer: buffer + detergent + preservative.
9	Empty well
10	Reading cuvette with substrate: 4-Methyl-umbelliferyl phosphate (0.6 mmol/L) + preservative.

**MATERIALS AND DISPOSABLES REQUIRED BUT NOT PROVIDED**

- Single-use pipette and/or micropipettes to dispense the appropriate volumes.
- Powderless disposable gloves.
- For other specific materials and disposables, please refer to the Instrument User Manual.
- Instruments of the VIDAS® family: VIDAS®, MINI VIDAS® or VIDAS® 3.

**WARNINGS AND PRECAUTIONS**

- **For Emergency Use Authorization (EUA) only**
- **For *in vitro* diagnostic use only.**
- This test has not been FDA cleared or approved; this test has been authorized by FDA under an EUA for use by laboratories certified under CLIA, that meet requirements to perform moderate or high complexity tests.
- **For professional use only, by qualified laboratory personnel in clinical laboratories.**
- **Caution: US Federal Law restricts this device to sale by or on the order of a licensed practitioner.**
- This test has been authorized only for the presence of IgM antibodies against SARS-CoV-2, not for any other viruses or pathogens. This test is only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of *in vitro* diagnostic tests for detection and/or diagnosis of COVID-19 under Section 564(b)(1) of the Act, 21 U.S.C. § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner.
- Perform the procedure given in this package insert as described. Any deviation from the outlined protocols may result in assay failure or cause erroneous results. Modifications to assay reagents, assay protocol, or instrumentation is not permitted, and are in violation of the product Emergency Use Authorization.
- This kit does not contain products of human origin.
- This kit contains products of animal origin. Certified knowledge of the origin and/or sanitary state of the animals does not totally guarantee the absence of transmissible pathogenic agents. It is therefore recommended that these products be treated as potentially infectious, and handled observing the usual safety precautions (do not ingest; do not inhale) using safe laboratory procedures such as those outlined in CDC/ NIH Biosafety in Microbiological and Biomedical Laboratories, and in the CLSI Document M29 Protection of Laboratory Workers from Occupationally Acquired Infections.
- Do not use the SPR devices if the pouch is pierced or if the dot sealing a SPR device has come unstuck.
- Do not use visibly deteriorated strips (damaged foil or plastic).
- Do not use visibly deteriorated components.
- Do not use reagents after the expiration date indicated on the box label.
- Do not mix reagents (or disposables) from different lots.
- VIDAS® SARS-COV-2 IgM assay reagents are only for use with the instruments of the VIDAS® family.
- Use powderless gloves, as powder has been reported to cause false results for certain enzyme immunoassay tests.
- Kit reagents contain sodium azide which can react with lead or copper plumbing to form explosive metal azides. If any liquid containing sodium azide is disposed of in the plumbing system, drains should be flushed with water to avoid build-up.

- Refer to the hazard statements “H” and precautionary statements “P” indicated above.
- Spills should be wiped up thoroughly after treatment with liquid detergent or a solution of household bleach containing at least 0.5% sodium hypochlorite. See the User Manual for cleaning spills on or in the instrument. Do not autoclave solutions containing bleach.
- The instrument should be regularly cleaned and decontaminated (refer to the User Manual for user and preventive maintenance operations).

#### STORAGE CONDITIONS

- Store the kit at +2°C/+8°C.
- **Do not freeze reagents.**
- **Store all unused reagents at +2°C/+8°C.**
- After opening the kit, check that the SPR pouches are correctly sealed and undamaged. If not, do not use the SPR devices.
- **After use, carefully reseal the pouch with the desiccant inside to maintain stability of the SPR devices, and return the complete kit to +2°C/+8°C.**
- If stored according to the recommended conditions, all components are stable until the expiration date indicated on the box label.

#### SAMPLES

##### Specimen type and collection

Human serum or plasma (lithium heparin)

**Note:** Blood sampling tube results may vary from one manufacturer to another depending on the materials and additives used. Some collection tubes may contain substances which could interfere with test results.

##### Types of tubes validated

- Plastic tube with lithium heparin
- Plastic tube with clot activator

##### Sample preparation

The current WHO/DIL/LAB/99.1 document provides recommendations for sample preparation. <sup>5</sup>

For use of sample tubes, refer to the tube manufacturer's recommendations for use.

The pre-analytical step, including the preparation of blood samples, is an essential first step when performing medical analyses. In accordance with Good Laboratory Practice, this step is performed under the responsibility of the laboratory manager.

Insufficient clot time can result in the formation of fibrin with micro-clots that are invisible to the naked eye. The presence of fibrin, red blood cells, or suspended particles can lead to erroneous results.

Samples containing suspended fibrin particles or erythrocyte stroma should be centrifuged before testing.

For serum samples, ensure that complete clot formation has taken place prior to centrifugation. Some specimens, especially those from patients receiving anticoagulant or thrombolytic therapy, may exhibit increased clotting times.

##### Preparation of frozen-stored samples

After thawing, all samples must be mixed before testing. Mix using a vortex-type mixer. If necessary, clarify the samples by centrifuging before testing (20 minutes at 2000 g or 10 minutes at 3900 g).

##### Sample stability

Samples can be stored in closed primary tubes at +18°C/+25°C for up to 6 hours or aliquoted at +2°C/+8°C for two days. If longer storage is required, freeze the serum or plasma at -19°C/-31°C.

These samples can be stored for up to 1 month at -19°C/-31°C, with up to three freeze/thaw cycles.

As an alternate to the above, the individual laboratory may determine specific specimen stability criteria for their laboratory per their laboratory workflow.

##### Sample-related interference

It is recommended not to use hemolyzed, lipemic, icteric samples, and, if possible, to collect a new sample.

Refer to the section **PERFORMANCE – Study of potentially interfering substances** for the compounds tested.

## INSTRUCTIONS FOR USE

For complete instructions, see the Instrument User Manual.

### Reading VIDAS® PTC (Protocol Test Change) data and MLE data

#### When using the assay for the first time

With the external instrument barcode reader, **scan the barcodes (PTC and MLE) in the following order:**

1. According to the instrument used, scan the PTC barcode(s) downloadable from [www.biomerieux.com/techlib](http://www.biomerieux.com/techlib). This reading allows VIDAS® PTC protocol data to be transferred to the instrument software for its update.
2. Scan the MLE data on the box label.

#### When opening a new lot of reagents

With the external instrument barcode reader, scan the MLE data on the box label before performing the test.

**Note: The master lot data need only be entered once for each lot.**

It is possible to enter MLE data **manually or automatically** depending on the instrument (refer to the User Manual).

#### Calibration

Calibration, using the standard provided in the kit, must be performed each time a new lot of reagents is opened, after the MLE data have been entered, and then every 28 days.

This operation compensates for possible minor variations in assay signal throughout the shelf life of the kit.

The standard, identified by S1, must be tested in duplicate.

The standard value must be within the set RFV (Relative Fluorescence Value) range indicated in the MLE data. If this is not the case, recalibrate.

#### Kit controls

Two controls are included in this kit.

The kit controls must be used to validate each calibration. The kit controls must be performed immediately after opening a new kit to ensure that reagent performance has not been altered.

**Note:** Any other use of the kit control is under the customer's responsibility.

The instrument will check the control values only if the controls are identified by C1 or C2.

Results cannot be validated if the control values deviate from the expected values.

#### Procedure

1. **Remove the kit from storage at +2°C/+8°C and take out the required reagents. Carefully reseal the SPR pouch and return the kit to +2°C/+8°C.** The reagents can be used immediately.
2. Use one strip and one SPR device for each sample, control or standard to be tested. Make sure the SPR pouch has been carefully resealed after the required SPR devices have been removed.
3. The test is identified by the **9COM** code on the instrument. The standard, identified by S1, must be tested in duplicate. The controls, identified by C1 and C2, must be tested singly.
4. If necessary, clarify samples by centrifugation.
5. Mix the standard and controls using a vortex-type mixer.
6. For optimal results, refer to all the paragraphs in the **SAMPLES** section.
7. Before pipetting, ensure that the samples, standard and controls are free of bubbles.
8. **For this test, the standard, controls and sample test portion is 100 µL.**

**Caution: For the VIDAS® 3 instrument, standard and controls must be pipetted manually into the sample well.**

9. Insert the SPR devices and the strips into the instrument.
10. Initiate the assay as directed in the User Manual. All the assay steps are performed automatically by the instrument.
11. The assay will be completed within **approximately 27 minutes**. After the assay is completed, remove the SPR devices and strips from the instrument.
12. Close the vials and return them to the required temperature after pipetting.
13. Dispose of the used SPR devices and strips into an appropriate recipient.

#### QUALITY CONTROL

Additional quality controls can be performed in accordance with local regulations or requirements related to accreditation, as well as requirements defined in the laboratory's quality control procedure.

## RESULTS AND INTERPRETATION

Once the assay is completed, results are analyzed automatically by the computer. Fluorescence is measured twice in the Reagent Strip's reading cuvette for each sample tested. The first reading is a background reading of the substrate cuvette before the SPR device is introduced into the substrate.

The second reading is taken after incubating the substrate with the enzyme that may be bound to the interior of the SPR device.

The RFV (Relative Fluorescence Value) is calculated by subtracting the background reading from the final result. This calculation appears on the result sheet.

The patient RFV is interpreted by the VIDAS® system as follows:

Test value = patient RFV / standard RFV

The test value and interpretation are also indicated on the result sheet.

### Interpretation of results

Interpretation of results according to test value (i) is as follows:

Index	Test Result	Interpretation
$i < 1.00$	Negative	IgM antibodies to SARS-CoV-2 not detected
$i \geq 1.00$	Positive	IgM antibodies to SARS-CoV-2 detected

### LIMITATIONS OF THE METHOD

- SARS-CoV-2 antibodies may be below detectable levels in patients who have been exhibiting symptoms for less than 15 days.
- The assay has only been validated using Lithium heparin plasma and serum.
- This test is for clinical laboratory use only. It is not for point of care or home use.
- A positive result may not indicate previous SARS-CoV-2 infection. Consider other information including clinical history and local disease prevalence, in assessing the need for a second but different serology test to confirm an immune response.
- A negative result for an individual subject indicates absence of detectable anti-SARS-CoV-2 antibodies. Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for patient management decisions. A negative result can occur if the quantity of the anti-SARS-CoV-2 antibodies present in the specimen is below the detection limits of the assay, or the antibodies that are detected are not present during the stage of disease in which a sample is collected. Patient specimens may be nonreactive if collected during the early (pre-seroconversion) phase of illness or due to a decline in titer over time. In addition, the immune response may be depressed in elderly, immunocompromised, or immunosuppressed patients.
- Six false positive (FP) results were observed while testing the cross-reactivity panel members—(1) Anti-Nuclear Antibody, (2) Rheumatoid Factor, (1) *Plasmodium Falciparum*, (1) *Trypanosoma cruzi*, and (1) Coronavirus NL63.
- Interference may be encountered with certain sera containing antibodies directed against reagent components. For this reason, assay results should be interpreted taking into consideration the patient's clinical history and the results of any other tests performed.
- Results obtained using samples from SARS-CoV-2 infected patients must be interpreted with caution.
- This assay is intended for qualitative detection only. Test value itself cannot be used to determine the quantity of SARS-CoV-2 IgM antibodies.
- The magnitude of the measured result above the threshold is not indicative of the total amount of antibody present in the sample.
- The individual immune response following SARS-CoV-2 infection varies considerably and might give different results with assays from different manufacturers. Results of assays from different manufacturers should not be used interchangeably.
- This test should not be used to diagnose or exclude acute SARS-CoV-2 infection. Negative results do not rule out SARS-CoV-2 infection, particularly in those who have been in contact with the virus. Testing with a molecular diagnostic should be performed to evaluate for active infection in symptomatic individuals.
- Results from antibody testing should not be used to diagnose or exclude acute SARS-CoV-2 infection. Results are not intended to be used as the sole basis for patient management decisions.
- The assay performance characteristics have not been established for matrices other than serum or plasma.
- It is not known at this time if the presence of antibodies to SARS-CoV-2 confers immunity to reinfection.
- Positive results may be due to past or present infection with non-SARS-CoV-2 coronavirus strains, such as coronavirus HKU1 or OC43.
- Not for the screening of donated blood.

## CONDITIONS OF AUTHORIZATIONS FOR THE LABORATORIES

The VIDAS® SARS-COV-2 IgM assay Letter of Authorization, along with the authorized Fact Sheet for Healthcare Providers, the authorized Fact Sheet for Recipients, and authorized labeling are available on the FDA website: <https://www.fda.gov/medical-devices/emergency-situations-medical-devices/emergency-use-authorizations#covid19ivd>.

Authorized laboratories using the VIDAS® SARS-COV-2 IgM (“your product” in the conditions below), must adhere to the Conditions of Authorization indicated in the Letter of Authorization as listed below:

- Authorized laboratories\* using your product will include with test result reports, all authorized Fact Sheets. Under exigent circumstances, other appropriate methods for disseminating these Fact Sheets may be used, which may include mass media.
- Authorized laboratories using your product will use your product as outlined in the authorized labeling . Deviations from the authorized procedures, including the authorized instruments, authorized clinical specimen types, authorized control materials, authorized other ancillary reagents and authorized materials required to use your product are not permitted.
- Authorized laboratories that receive your product will notify the relevant public health authorities of their intent to run your product prior to initiating testing.
- Authorized laboratories using your product will have a process in place for reporting test results to healthcare providers and relevant public health authorities, as appropriate.
- Authorized laboratories will collect information on the performance of your product and report to DMD/OHT7-OIR/ OPEQ/CDRH (via email: CDRH-EUA-Reporting@fda.hhs.gov) and bioMérieux local technical support center (800-682-2666 or CustomerService-ImmunoMolecular@biomerieux.com) any suspected occurrence of false reactive or false non-reactive results and significant deviations from the established performance characteristics of your product of which they become aware.
- All laboratory personnel using your product must be appropriately trained in immunoassay techniques and use appropriate laboratory and personal protective equipment when handling this kit, and use your product in accordance with the authorized labeling. All laboratory personnel using the assay must also be trained in and be familiar with the interpretation of results of the product.
- bioMérieux, authorized distributors, and authorized laboratories using your product will ensure that any records associated with this EUA are maintained until otherwise notified by FDA. Such records will be made available to FDA for inspection upon request.

\* The letter of authorization refers to, “Laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, that meet requirements to perform moderate and high complexity tests” as “authorized laboratories.”

## PERFORMANCE

Studies performed using the VIDAS® SARS-COV-2 IgM assay gave the following results:

### Precision

A precision study was performed according to CLSI EP05-A3 recommendations.

A panel of human samples representing index levels in the qualitative range of the assay was analyzed on the VIDAS® instrument to include the following main sources of variability: repeatability, run, calibration and day.

Four samples were tested in triplicate in two runs per day, over six days using one VIDAS® instrument (N=36 values for each sample). Repeatability (within-run precision) and total within-lot within-instrument precision were estimated for each sample.

The precision estimates obtained for each sample are reported in the following table, as a guide.

Sample	N	Mean index	Repeatability Within-run precision		Within-lot within-instrument total precision	
			Standard Deviation Index	CV (%)	Standard Deviation Index	CV (%)
Sample 1	36	0.04	0.01	32.70	0.01	35.40
Sample 2	36	0.95	0.08	8.80	0.09	9.70
Sample 3	36	1.53	0.16	10.20	0.18	11.90
Sample 4	36	5.81	0.45	7.80	0.50	8.60

### Class Specificity

Antibody class specificity between IgM and IgG was tested for cross reactivity and competition on the VIDAS® instrument.

Cross reaction: 5 negative samples were tested in duplicate, then were spiked with 10 µg/mL of a recombinant human monoclonal IgG (rec Hu mAb IgG) anti SARS-CoV-2 and tested again in duplicate. All IgG spiked samples showed negative results with the VIDAS SARS-CoV-2 IgM Test.

Competition: 7 IgM positive samples with various levels of index values were tested in duplicate, then were spiked with 10 µg/mL of rec Hu mAb IgG anti SARS-CoV-2 and tested again in duplicate.

For both set of samples, i.e. negative and positive samples, an agreement of 100% was obtained between control and spiked samples.

**Matrix Equivalency**

Twenty (20) pairs of serum and lithium-heparin plasma samples were tested in duplicate on the VIDAS® instrument.

Matrix equivalency was determined according to the Deming linear regression model in accordance with CLSI Document EP09-A3.

N	Plasma index interval (y)	Serum index interval (x)	Slope	Intercept	r
20	[ 0.03 ; 4.99]	[ 0.03 ; 4.72]	1.0356	-0.0343	0.9982

Serum and lithium-heparin plasma matrices gave equivalent results with VIDAS® SARS-COV-2 IgM assay.

**Analytical specificity****Cross-reactivity**

The notion of cross-reactivity is the study of samples which are negative for the test to be evaluated and positive for the potentially interfering condition. The presence of these potentially interfering conditions must not modify the interpretation of the VIDAS® SARS-COV-2 IgM assay.

The results of the 149 samples tested on one lot and on the VIDAS® instrument are presented in the following table.

Sample category/ Antibody positive samples for	Number of samples tested	Number of positive samples
Anti-Nuclear Antibody	5	1*
Rheumatoid factor	5	2**
Human Anti-Mouse Antibody	5	0
<i>Borrelia burgdorferi</i>	10	0
Haemophilus Influenza B	5	0
<i>Plasmodium falciparum</i>	3	1***
<i>Toxoplasma gondii</i>	10	0
<i>Treponema pallidum</i>	3	0
<i>Trypanosoma cruzi</i>	5	1****
Hepatitis A Virus	3	0
Hepatitis B Virus	5	0
Hepatitis C Virus	5	0
Hepatitis E Virus	7	0
Herpes Simplex Virus	6	0
Human Immuno-deficiency Virus	5	0
Cytomegalovirus	4	0
Measles Virus	4	0
Mumps Virus	1	0
Rubella Virus	10	0
Dengue Virus	3	0
West Nile Virus	4	0
Yellow Fever Virus	4	0
Zika Virus	5	0
Influenza A and B Virus	10	0
Respiratory Syncytial Virus	10	0
Coronavirus NL63	6	1*****
Coronavirus 229E	6	0
<b>Total</b>	<b>149</b>	<b>6</b>

\*1 out of 5 samples with anti-nuclear antibodies showed a false positive result

\*\*2 out of 5 samples with Rheumatoid factor showed false positive results.

\*\*\*1 out of 3 samples with antibodies against Plasmodium Falciparum showed false positive results

\*\*\*\*1 out of 5 samples with antibodies against Trypanosoma cruzi showed false positive results

\*\*\*\*\*1 out of 6 samples with antibodies against the coronavirus NL63 showed false positive results



### Study of Potentially Interfering Substances

Potential interference by commonly used substances was evaluated on 5 replicates of low and moderate SARS-CoV-2 IgM positive specimens according to CLSI EP07-Ed3 recommendations.

No interference was detected up to the concentrations indicated below:

Tested substance	Concentration
Hemoglobin	10 g/L
Lipids	30 g/L
Albumin	60 g/L
Conjugated bilirubin	0.4 g/L
Unconjugated bilirubin	0.4 g/L

### CLINICAL PERFORMANCE

#### Negative Percent Agreement (NPA)

A total of 308 samples collected from negative individuals before September 2019 were tested singly using the VIDAS® SARS-COV-2 IgM assay on the VIDAS® instrument. Two false positive samples were detected. The resulting overall specificity in the internal study was 99.4% [97.7-99.9].

#### Positive Percent Agreement (PPA)

The positive percent agreement was determined by evaluating the VIDAS® SARS-COV-2 IgM assay with samples collected from 112 SARS-CoV-2 PCR patients. The 112 subjects were tested singly using the VIDAS® SARS-COV-2 IgM assay on the VIDAS® instrument.

The following table describes positive percent agreement by time of sampling after a PCR positive result.

#### Detection of IgM in 111 PCR Positive subjects

Days from PCR Positive Result	Total PCR Positive Samples	VIDAS SARS-COV-2 IgM Results		
		Number Reactive	Number Non-Reactive	PPA (95% CI)
≤ 7	91	49	42	53.8% [ 43.7 ; 63.7 ]
8-14	8	8	0	100.0% [ 63.1 ; 100.0 ]
15-30	12	12	0	100.0% [ 73.5 ; 100.0 ]
Total Subjects	111*			

\* For 1 patient, the number of days from PCR positive result was > 30 days and was not reported in the analysis, this sample was found positive with VIDAS SARS-COV-2 IgM assay.

For 59 out of the 111 patients, number of days between specimen collection date and symptom onset was also provided. Positive percent agreement was determined by investigating these 59 samples.

#### Detection of IgM in 59 subjects from Symptom Onset

Days from Onset of Symptoms	Total PCR Positive Samples	VIDAS SARS-COV-2 IgM Results		
		Number Reactive	Number Non-Reactive	PPA (95% CI)
≤ 7	19	7	12	36.8% [ 19.1 ; 59.0 ]
8-14	17	14	3	82.4% [ 59.0 ; 93.8 ]
15-30	23	23	0	100.0% [ 85.2 ; 100.0 ]
Total Subjects	59*			

\* For 1 patient, the number of days from PCR positive result was > 30 days and was not reported in the analysis, this sample was found positive with VIDAS SARS-COV-2 IgM assay.

For some patients, different specimens were collected over time in a longitudinal study to evaluate seroconversion with the VIDAS SARS-COV-2 IgM assay as shown below:

Detection of IgM in SARS-CoV-2 PCR Positive Samples from 112 Subjects Stratified by Days from PCR Positive Result across Different Bleeds

Days from PCR Positive Result	First Serial Measurement		Second Serial Measurement		Third Serial Measurement		Fourth Serial Measurement		Fifth Serial Measurement	
	Samples tested	Samples with IgM + Results	Samples tested	Samples with IgM + Results	Samples tested	Samples with IgM + Results	Samples tested	Samples with IgM + Results	Samples tested	Samples with IgM + Results
≤ 7 days	91	49/91	11	5/11	-	-	-	-	-	-
8-14 days	8	8/8	8	7/8	11	9/11	-	-	-	-
≥ 15 days	13	13/13	7	7/7	6	6/6	6	6/6	1	1/1
Total Subjects	112	-	26	-	17	-	6	-	1	-

Detection of IgM in Samples from 60 Subjects Stratified by Days Post-Symptom Onset across Different Bleeds

Days Post Symptoms Onset	First Serial Measurement		Second Serial Measurement		Third Serial Measurement		Fourth Serial Measurement		Fifth Serial Measurement	
	Samples tested	Samples with IgM + Results	Samples tested	Samples with IgM + Results	Samples tested	Samples with IgM + Results	Samples tested	Samples with IgM + Results	Samples tested	Samples with IgM + Results
≤ 7 days	19	7/19	-	-	-	-	-	-	-	-
8-14 days	17	14/17	6	4/6	1	1/1	-	-	-	-
≥ 15 days	24	24/24	10	10/10	9	9/9	4	4/4	1	1/1
Total Subjects	60	-	16	-	10	-	4	-	1	-

**Note:** In this document, sensitivity and Positive Percent Agreement are used interchangeably, since COVID-19 diagnosis is solely based on PCR results.

### Longitudinal Studies

The following table shows SARS-CoV-2 IgM seroconversion based on the test results of three patients tested with the VIDAS® SARS-COV-2 IgM assay.

	Number of Days after PCR Positive Results	IgM Index	IgM Interpretation
Patient 1	0	0.06	Negative
	7	1.20	Positive
	14	2.81	Positive
	20	2.37	Positive
Patient 2	0	0.01	Negative
	7	0.63	Negative
	14	4.30	Positive
	20	3.31	Positive
Patient 3	0	0.05	Negative
	5	2.13	Positive
	14	16.74	Positive
	26	16.73	Positive

**WASTE DISPOSAL**











Dispose of used or unused reagents, as well as any other contaminated disposable materials, following procedures for infectious or potentially infectious products.

It is the responsibility of each laboratory to handle waste and effluents produced, according to their nature and degree of hazardousness, and to treat and dispose of them (or have them treated and disposed of) in accordance with any applicable regulations.

**LITERATURE REFERENCES**

1. Huang C, Wang Y, Li X *et al.* - Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. - *Lancet* - 2020 Feb 15;395(10223):497-506.
2. Zou L, Ruan F, Huang M *et al.* - SARS-CoV-2 viral load in upper respiratory specimens of infected patients. - *N Engl J Med.* - 2020 Mar 19;382(12):1177-9.
3. Guo L, Ren L, Yang S *et al.* - Profiling early humoral response to diagnose novel coronavirus disease (COVID-19). - *Clin Infect Dis.* - 2020 March 21:ciaa310. doi: 10.1093/cid/ciaa310.
4. To KKW, Tsang OTY, Leung WS *et al.* - Temporal profiles of viral load in posterior oropharyngeal saliva samples and serum antibody responses during infection by SARS-CoV-2: an observational cohort study. - *Lancet Infect Dis.* - 2020 Mar 23: S1473-3099(20)30196-1.
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**INDEX OF SYMBOLS**

Symbol	Meaning
	Catalogue number
	<i>In Vitro</i> Diagnostic Medical Device
	Manufacturer
	Temperature limit
	Use by date
	Batch code
	Consult Instructions for Use
	Contains sufficient for <n> tests
	For US Only: Caution: US Federal Law restricts this device to sale by or on the order of a licensed practitioner
	Date of manufacture

**LIMITED WARRANTY**

bioMérieux warrants the performance of the product for its stated intended use provided that all procedures for usage, storage and handling, shelf life (when applicable), and precautions are strictly followed as detailed in the instructions for use (IFU).

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**REVISION HISTORY**

## Change type categories

N/A	Not applicable (First publication)
Correction	Correction of documentation anomalies
Technical change	Addition, revision and/or removal of information related to the product
Administrative	Implementation of non-technical changes noticeable to the user

**Note:** *Minor typographical, grammar, and formatting changes are not included in the revision history.*

Release Date	Part Number	Change Type	Change Summary
2020-05	056097-01	N/A	First publication
2020-07	056097-02	Technical change	Limitations of the Method / Sample Stability / Sample-related interference / Procedure / Interpretation of Results / Performance / Clinical
		Administrative	Intended Use / Content of the Kit (60 tests) / Warnings and Precautions / Analytical specificity / Conditions of Authorizations of the Laboratories /

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