Read this Instructions for Use carefully before testing.

For in vitro diagnostic use only

MIZUHO MEDY Co., Ltd.

SARS coronavirus antigen kit
Influenza virus kit

Quick Chaser SARS-CoV-2/Flu A, B

[Important and fundamental caution]

1) Negative results should be treated as presumptive and do not rule out SARS-CoV-2 and influenza infection.
2) As for the diagnosis of coronavirus infection and influenza virus infection, refer to the latest information for medical institutions and testing laboratories issued from the government authority, and should not be based solely on the test results of this product but should be comprehensively made in consideration of other test results and clinical symptoms.
3) Regarding the specimen for the test, refer to the local guidelines for COVID-19 testing and specimen collection.
4) When using a nasal (anterior nares) swab as a specimen, the detection rate tends to be lower than that of a nasopharyngeal swab, so please pay attention to the specimen collection methods.
5) Take necessary biosafety measures for specimen collection and handling.

[General precautions]

1) For in vitro diagnostic use only.
2) Procedures not described in the Instructions for Use are not guaranteed.

[Package]

68600: Quick Chaser SARS-CoV-2/Flu A, B - 10 tests/kit

[Contents]

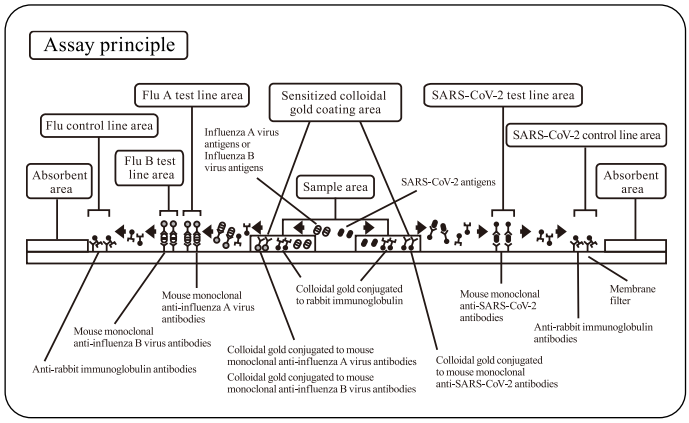
1) Test plate - 10 tests
   - Mouse monoclonal anti-SARS-CoV-2 antibodies
   - Mouse monoclonal anti-influenza A virus antibodies
   - Mouse monoclonal anti-influenza B virus antibodies
   - Colloidal gold conjugated to mouse monoclonal anti-SARS-CoV-2 antibodies
   - Colloidal gold conjugated to mouse monoclonal anti-influenza A virus antibodies
   - Colloidal gold conjugated to mouse monoclonal anti-influenza B virus antibodies
2) Extraction reagent solution vial - 0.5mL×10 vials
   Extraction reagent solution is buffer containing detergent.
   Note) Extraction reagent solution of the following Quick Chaser products can be shared.
   - Influenza virus kit Quick Chaser Flu A, B
   - Adenovirus kit Quick Chaser Adeno
   - SARS coronavirus antigen kit, Influenza virus kit
     Quick Chaser SARS-CoV-2/Flu
     Quick Chaser SARS-CoV-2/Flu A, B
   - SARS coronavirus antigen kit Quick Chaser SARS-CoV-2
   - SARS coronavirus antigen kit, RS virus kit
     Quick Chaser SARS-CoV-2/RSV
3) Swab (for nasopharyngeal swab specimen & nasal swab specimen) - 10 pieces
4) Filter (for extraction reagent solution vial) - 10 pieces
5) Filter cap - 10 pieces

[Intended use]

For detection of SARS-CoV-2 antigen, influenza A virus antigen and influenza B virus antigen in nasopharyngeal swab specimen or nasal swab specimen.
(An aid in diagnosis of SARS-CoV-2 infection or influenza virus infection)

[Principle of the test]

Quick Chaser SARS-CoV-2/Flu A, B is the in vitro diagnostic reagent for detection of SARS-CoV-2 antigen and influenza virus antigen based on the immunochromatographic assay.
Colloidal gold conjugated to mouse monoclonal anti-SARS-CoV-2 antibodies or colloidal gold conjugated to mouse monoclonal anti-influenza A virus antibodies and colloidal gold conjugated to mouse monoclonal anti-influenza B virus antibodies, and colloidal gold conjugated to rabbit immunoglobulin for control line are coated in each sensitized colloidal gold coating area on a membrane filter which is set in test plate. Also, mouse monoclonal anti-SARS-CoV-2 antibodies are immobilized in SARS-CoV-2 test line area, mouse monoclonal anti-influenza A virus antibodies are immobilized in Flu A test line area, mouse monoclonal anti-influenza B virus antibodies are immobilized in Flu B test line area, and anti-rabbit immunoglobulin antibodies are immobilized in each control line area.
If SARS-CoV-2 antigens or influenza A virus or influenza B virus antigens are present in the sample, according to the principle of immunochromatography, SARS-CoV-2 antigens react with colloidal gold conjugated to mouse monoclonal anti-SARS-CoV-2 antibodies, influenza A virus and influenza B virus antigens react respectively with colloidal gold conjugated to mouse monoclonal anti-influenza A virus antibodies and colloidal gold conjugated to mouse monoclonal anti-influenza B virus antibodies as they migrate from the sample area. Moreover, they will be captured in each test line area by reacting respectively with mouse monoclonal anti-SARS-CoV-2 antibodies, mouse monoclonal anti-influenza A and mouse monoclonal anti-influenza B. As a result, a purple-red line with the colloidal gold appears in each test line area. At the same time, the colloidal gold conjugated to rabbit immunoglobulins also migrates and will be captured by the anti-rabbit immunoglobulin antibodies on each control line area, resulting in the appearance of a purple-red line in each control line area regardless of the presence or absence of SARS-CoV-2 antigen, influenza A antigen and influenza B virus antigen.



[Procedural precautions]

1) Collected specimen should be prepared as a sample in accordance with after-mentioned "Sample preparation" in [Test procedure] and tested as soon as possible.
2) When adding a sample, keep the tip of the filter by about 10mm from the center of the sample area so that a drop can be formed, and add the specified volume (4 drops). If the sample volume is not as specified, the reaction may not be accurate.
3) Bring test plate and extraction reagent solution to 15 to 30℃ prior to testing.
4) Strictly follow interpretation time to avoid false-negative and false-positive.
5) Interfering substances and medications
   Following substances and blood did not interfere with the performance of this product at the concentration listed below.
   • Acetylsalicylic acid (5mg/mL)
   • Ibuprofen (5mg/mL)
   • Diphenhydramine hydrochloride (5mg/mL)
   • Oxymetazoline hydrochloride (5mg/mL)
   • Dextromethorphan hydrobromide (5mg/mL)
   • Phenylephrine hydrochloride (5mg/mL)
   • Cold medicine (concentration of Acetaminophen: 5mg/mL)
   • Nasal drop 1, containing Sodium cromoglicate, Chlorpheniramine maleate, Naphazoline hydrochloride (10%)
   • Nasal drop 2, containing Ketotifen fumarate (10%)
   • Inhaled medication 1, containing Salbutamol sulfate (10%)
   • Inhaled medication 2, containing Bromhexine hydrochloride (10%)
   • Intraoral antiphlogistic, containing Sodium Azulene Sulfonate (10%)
   • Blood (1%)
   Regarding the sample containing 1% or more blood, collect specimen again because such sample could give influence to the interpretation.
6) Cross reactivity
   • Regarding SARS-CoV-2, cross reactivity at Flu A and Flu B test line area was not observed.
   • Regarding the following influenza A viruses, cross reactivity at the SARS-CoV-2 test line area and Flu B test line area was not observed.
     Influenza A virus（H1N1pdm） Influenza A virus（H3N2）
   • Regarding the following influenza B viruses, cross reactivity at the SARS-CoV-2 test line area and Flu A test line area was not observed.
     Influenza B virus（Yamagata） Influenza B virus（Victoria)

• Cross reactivity was not observed with the following viruses and bacteria.

<Viruses>

Adenovirus（Type 1）	Adenovirus（Type 2）
Adenovirus（Type 3）	Adenovirus（Type 4）
Adenovirus（Type 5）	Adenovirus（Type 6）
Adenovirus（Type 7）	Adenovirus（Type 11）
Coxsackievirus A9	Coxsackievirus B5
Human Echovirus 9	Herpes simplex virus type1
Mumps virus	Parainfluenza virus 1
Rhinovirus 8	Human Metapneumovirus
Respiratory syncytial virus	

<Bacteria>

Bordetella pertussis	*Candida albicans*
Hemophilus influenzae	*Klebsiella pneumoniae*
Listeria monocytogenes	*Moraxella catarrhalis*
Mycoplasma pneumoniae	*Pseudomonas aeruginosa*
Serratia marcescens	*Staphylococcus aureus*
Staphylococcus epidermidis	*Streptococcus agalactiae* (Group B)
Streptococcus mutants	*Streptococcus pneumoniae*
Streptococcus pyogenes (Group A)	

Reactivity with other coronaviruses

・No reactivity was observed with the following coronaviruses.
Human coronavirus 229E （1.0×10^6 $TCID_{50}$/mL）

・No reactivity was observed with the following recombinant coronavirus antigens.

MERS-CoV（1μg/mL）	HCoV-OC43（1μg/mL）
HCoV-NL63（1μg/mL）	HCoV-HKU1（1μg/mL）

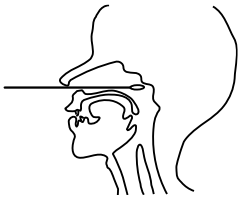
Regarding SARS-CoV, cross reactivity was observed at the SARS-CoV-2 test line.

[Test procedure]

This product can only be interpreted visually.

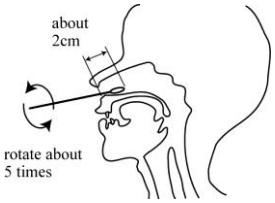
• Specimen collection

1) Preparation of specimen collection
   1. Swab: Use swab included in this test kit.
   2. Extraction reagent solution: Use without preparation.
2) Specimen collection
   1. Nasopharyngeal swab specimen:
      Along inferior nasal conchae (imaging a horizontal plane connecting nostril with external acoustic meatus), insert a swab in the nasal cavity and rub it on the mucosal surface several times to collect mucous epidermis.

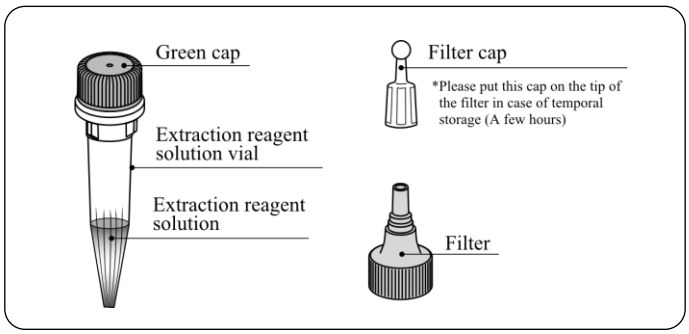


      Note) An elastic-plastic rod is employed in swabs to reduce the burden of patients. However, on the other hand, the tip of the swab may not be reached to the inflamed region on the wall of the nasal cavity or you may not be able to rub the tip on the wall of the nasal cavity adequately to collect enough volume of virus antigens, even though the tip of the swab is reached to the inflamed region on the wall of the nasal cavity. Therefore, make sure the tip of the swab is reached to the wall of the nasal cavity to rub the inflamed region at the time of collecting mucous epidermis.

   2. Nasal (anterior nares) swab specimen:
      Insert the swab inside the nostril for about 2 cm toward the center of the face and rotate the swab in a circular path against the nasal wall about 5 times and moisten it for about 5 seconds, and collect mucus epidermis



・Details of Extraction reagent solution vial



• Sample preparation

Relations of applicable specimens and mutual use of sample with another Quick Chaser product are as follows:

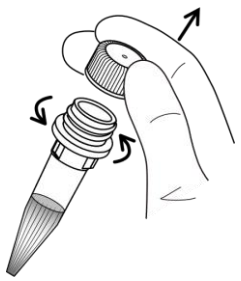
Product \ Specimen	Nasopharyngeal swab specimen	Nasal swab specimen[*1]
SARS-CoV-2/Flu A, B	○	○
Adeno	○	×

Applicable specimen : ○

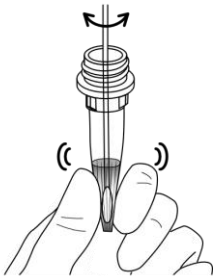
[*1] It is collected by inserting swab inside nostril about 2cm.

Note) Do not use sample mutually except the above combination.

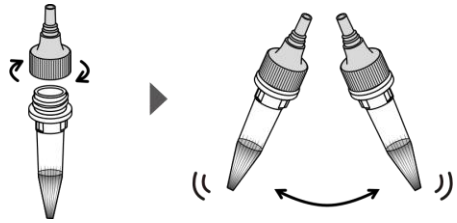
1. Loosen the green cap by turning it counterclockwise.



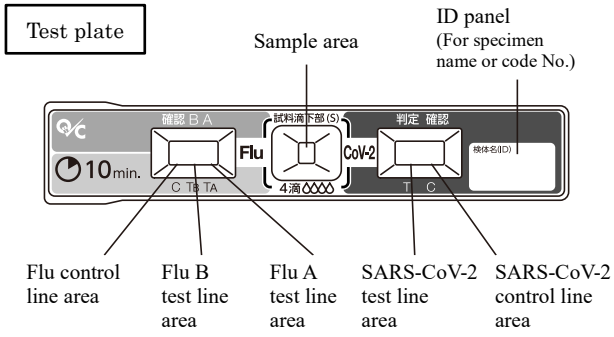
2. Insert the spherical tip with the specimen into the bottom of the extraction reagent solution vial and press the spherical tip from the outside of the vial for extracting the specimen. Turn the swab clockwise and counterclockwise about five times and rub the spherical tip on the inside wall and the bottom of the vial. Squeeze out liquid from the spherical tip and take the swab out of the vial.



3. Install filter and shake the vial gently to mix specimen thoroughly. The sample is ready for use.



· Details of test plate



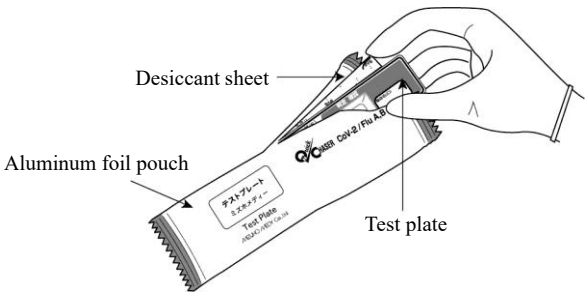
· Test procedure

1) Preparation of reagent

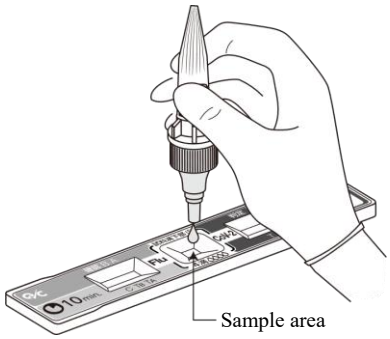
Test plate: No prior preparation required.

2) Test procedure

1. Remove test plate from the aluminum foil pouch. Discard the desiccant sheet included in the aluminum foil pouch.



2. Add 4 drops (about 150 μL) of sample to the sample area of the test plate from the extraction reagent solution vial containing the prepared sample. Hold the vial vertically so that the tip of the extraction filter does not come into contact with the sample area of the test plate.



3. Leave to react at 15 to 30˚C.

Interpret test results visually by reading lines in the test line area and control line area after 10 minutes.

[Interpretation]

Interpretation by the existence of red-purple lines in test line area and control line area.

<Positive>

Both test line and control line appear.

SARS-CoV-2 Positive

Flu A Positive

Flu B Positive

<Negative>

Only control lines appear.

Negative

<Retest>

If both test line and control line do not appear or no control line appears for either or both of SARS-CoV-2 and Flu A, B, an operational error such as insufficient sample volume may be considered. Recheck test procedure and retest with the new test plate. If the same result comes out in the retest again, confirm it with other methods.

Retest

Retest

• Interpretational precautions

1) In the case of SARS-CoV-2 test line, Flu A test line or Flu B test line and control line appear even before 10 minutes after dropping the sample, it can be interpreted as SARS-CoV-2 positive, Flu A positive or Flu B positive. Negative should be interpreted at 10 minutes after dropping the sample. The streak line might appear before 10 minutes temporarily. Do not interpret the temporal streak line as the appearance of the test line. After 10 minutes, colloidal gold can appear like a line due to the drying of the test plate with time. Therefore, please interpret test results at 10 minutes.

2) This product is used as an aid in the diagnosis of SARS-CoV-2 infection and influenza virus infection. In case SARS-CoV-2 and influenza virus antigens amount in the specimen are below the detection sensitivity of the test or inadequate specimen collection, test result could be interpreted as negative, even though the patient is infected by SARS-CoV-2 or influenza virus. In addition, a non-specific reaction may occur depending on the factors in the sample, and a negative specimen may be interpreted as positive. The final definitive diagnosis should be made comprehensively from clinical symptoms and other test results.
3) If test lines appear in 2 or more test line areas, there is a possibility of dual infections of SARS-CoV-2, Flu A, or Flu B; however, to be sure, collect a new specimen and perform the test again. In addition, please make a comprehensive judgment based on clinical symptoms and other test results.
4) When administering a nasal spray influenza vaccine, antigens from the vaccine will be excreted in specimens for several days, potentially leading to a positive result.

[Clinical significance]

Quick Chaser SARS-CoV-2/Flu A, B can rapidly detect SARS-CoV-2 and influenza antigens with a simple operation and is considered to be useful as an aid in the diagnosis of SARS-CoV-2 infection and influenza infection.

(Summary of clinical performance)

＜SARS-CoV-2＞

1) Correlations with RT-PCR method using clinical specimens preserved in Japan (nasopharyngeal swab specimens suspended in transport medium)

Quick Chaser SARS-CoV-2/Flu A, B

		Positive	Negative	Total
RT-PCR method	Positive	56	17	73
	Negative	0	102	102
	Total	56	119	175

Positive agreement rate: 76.7% (56/73)
Negative agreement rate: 100% (102/102)
Total agreement rate: 90.3% (158/175)

The following table shows the positive agreement rate stratified by the viral RNA load of RT-PCR positive specimens.

Viral RNA load (RNA copy/test)	The number of positive results by this product /specimens (Positive agreement rate)
100,000 or more	26/26 (100%)
10,000 ~ 100,000	20/20 (100%)
1,600 ~ 10,000	10/12 (83.3%)
400 ~ 1,600	0/1 (0.0%)
under 400	0/14 (0.0%)

Positive agreement rate was 96.6% (56/58) when the viral load was 1,600 copies/test or more, and 94.9% (56/59) when the viral load was 400 copies/test or more.

2) Correlations with RT-PCR method using clinical specimens preserved in Japan (nasal swab specimens suspended in transport medium)

Quick Chaser SARS-CoV-2/Flu A, B

		Positive	Negative	Total
RT-PCR method	Positive	22	25	47
	Negative	0	113	113
	Total	22	138	160

Positive agreement rate : 46.8% (22/47)
Negative agreement rate : 100% (113/113)
Total agreement rate : 84.4% (135/160)

The following table shows the positive agreement rate stratified according to the viral RNA load among RT-PCR positive specimens.

Viral RNA load (RNA copy/test)	The number of positive results by this product /specimens (Positive agreement rate)
100,000 or more	0/0
10,000 ~ 100,000	16/18 (88.9%)
1,600 ~ 10,000	6/10 (60.0%)
400 ~ 1,600	0/4 (0.0%)
under 400	0/15 (0.0%)

Positive agreement rate was 78.6% (22/28) when the viral load was 1,600 copies/test or more, and 68.8% (22/32) when the viral load was 400 copies/test or more.

<Influenza>

1) Two concentrations of cultured strains A/California/07/2009, A/Port Chalmers/1/73, and B/Florida/4/2006 near the detection limit were added to the nasopharyngeal swab solution and measured with Quick Chaser SARS-CoV-2/Flu A, B.

Cultured strain of influenza virus		Concentration ($CEID_{50}$/mL)	Quick Chaser SARS-CoV-2/ Flu A, B			Total
			Flu A Positive	Flu B Positive	Negative	
Influenza A virus	A/California /07/2009 (H1N1)	1.08×10^4	15	0	0	15
		2.71×10^4	15	0	0	15
	A/Port Chalmers /1/73 (H3N2)	1.48×10^4	15	0	0	15
		3.70×10^4	15	0	0	15
Influenza B virus	B/Florida/ 4/2006	1.53×10^5	0	15	0	15
		3.82×10^5	0	15	0	15
Negative		No addition	0	0	30	30
Total			60	30	30	120

2) Two concentrations of cultured strains A/California/07/2009, A/Port Chalmers/1/73, and B/Florida/4/2006 near the detection limit were added to the nasal swab solution and measured with Quick Chaser SARS-CoV-2/Flu A, B.

Cultured strain of influenza virus		Concentration ($CEID_{50}$/mL)	Quick Chaser SARS-CoV-2/ Flu A, B			Total
			Flu A Positive	Flu B Positive	Negative	
Influenza A virus	A/California /07/2009 (H1N1)	1.08×10^4	15	0	0	15
		2.71×10^4	15	0	0	15
	A/Port Chalmers /1/73 (H3N2)	1.48×10^4	15	0	0	15
		3.70×10^4	15	0	0	15
Influenza B virus	B/Florida/ 4/2006	1.53×10^5	0	15	0	15
		3.82×10^5	0	15	0	15
Negative		No addition	0	0	30	30
Total			60	30	30	120

3) Correlations with the existing approved product (Immunochromatographic assay) using nasopharyngeal swab specimen

Quick Chaser SARS-CoV-2/Flu A, B

			Positive		Negative	Total
			Flu A	Flu B		
Other Product	Positive	Flu A	31	0	0	31
		Flu B	0	10	0	10
	Negative		2*	0	55	57
	Total		33	10	55	98

Flu A Positive agreement rate : 100% (31/31)
Flu B Positive agreement rate : 100%(10/10)
Negative agreement rate : 96.5% (55/57)
Total agreement rate : 98.0% (96/98)
*Regarding 2 cases where the results were negative with other product but flu A positive with this product, they were flu A positive with the RT-PCR method.

[Performance characteristics]

1) Performance

1. Sensitivity

- When SARS-CoV-2 In-house positive control [note 1)] was tested, SARS-CoV-2 positive result was obtained.
- When Flu A In-house positive control [note 2)] was tested, Flu A positive result was obtained.
- When Flu B In-house positive control [note 3)] was tested, Flu B positive result

was obtained.

2. Accuracy
   - When SARS-CoV-2 In-house positive control was tested, SARS-CoV-2 positive result was obtained.
   - When Flu A In-house positive control was tested, Flu A positive result was obtained.
   - When Flu B In-house positive control was tested, Flu B positive result was obtained.
   - When In-house negative control was tested, negative results were obtained in all of SARS-CoV-2, Flu A and Flu B.
3. Reproducibility
   - When SARS-CoV-2 In-house positive control was tested three times simultaneously, SARS-CoV-2 positive result was shown in all cases.
   - When Flu A In-house positive control was tested three times simultaneously, Flu A positive result was shown in all cases.
   - When Flu B In-house positive control was tested three times simultaneously, Flu B positive result was shown in all cases.
   - When In-house negative control was tested three times simultaneously, negative result was shown in all cases.

   Note 1) SARS-CoV-2 control antigen solution diluted with an in-house negative control to be equivalent to 400pg/mL of the calibration reference material.

   Note 2) Flu A control antigen solution diluted with an in-house negative control to be equivalent to 2.96×10^4 $CEID_{50}$/mL of the calibration reference material.

   Note 3) Flu B control antigen solution diluted with an in-house negative control to be equivalent to 3.06×10^5 $CEID_{50}$/mL of the calibration reference material.

   Note 4) Extraction reagent solution
   $CEID_{50}$: 50% Chick Embryo Infectious Dose
4. Detection limit
   SARS-CoV-2 detection
   Recombinant SARS-CoV-2 antigen 100pg/mL
   Influenza virus detection
   Influenza A virus antigen (A/Port Chalmer/1/73)
   7.41×10^3 $CEID_{50}$/mL
   Influenza B virus antigen (B/Florida/4/2006)
   7.64×10^4 $CEID_{50}$/mL

2) Calibration reference material (Standard material)
   SARS-CoV-2: Recombinant SARS-CoV-2 antigen
   Influenza A virus: A/Port Chalmer/1/73
   Influenza B virus: B/Florida/4/2006

[Precautions for use and handling]

1) Precautions for handling (Prevention of danger)
   1. Handle sample (specimen) with great care as there is a risk of infection.
   2. When using, wear protective equipment (glasses, disposable gloves, mask, etc.) and be careful not to let the sample (specimen) or extraction reagent solution directly adhere to the skin or get into your eyes.
   3. Do not collect the specimen with a swab soaked in the extraction reagent solution.
   4. If a sample (specimen) or extraction reagent solution accidentally gets into your eyes or mouth, take first-aid measures such as rinsing it thoroughly with water, and seek medical attention if necessary.
   5. The filter cap does not provide an airtight seal. Do not use it for purposes of transportation or preservation.
   6. Perform the specimen collection under the guidance of a qualified person.
   7. The material of the membrane used for the test plate is nitrocellulose. Do not perform tests near a fire as nitrocellulose is extremely flammable.
   8. If the sample (specimen) spatters, wipe it off with alcohol for disinfection, etc.

2) Precautions for use
   1. Do not freeze this product. Store it in accordance with the description of storage. Do not use frozen reagents as they may change the quality and may not give correct results.
   2. Do not use this product beyond the expiration date.
   3. Do not store extraction reagent solution vial sideways or upside down.
   4. Use the test plate immediately after opening the aluminum foil pouch. If the test plate is left in a room for a long time, it could not react by exposure to moisture.
   5. Do not touch sample area, test line area, and control line area by hand directly.
   6. Do not perform the test in a place such as under an air conditioner where the dry wind directly blows the surface of the test plate, to prevent uneven migration.
   7. Do not use the reagents, accessories, etc. of this product for any purpose other than this test.
   8. Test plate, swab, and extraction reagent solution vial (including filter and caps) are intended for single use only.
   9. Use swabs included in this product.
   10. Avoid getting swabs wet and store them away from direct sunlight, high temperature, and humidity.
   11. Do not touch the spherical tip of the swab before use.
   12. Do not press the spherical tip (sponge) or rod (handle) of the swab from the outside of the packaging at the time of taking out the swab from the packaging because the spherical tip could come off by the pressing load.
   13. Use swab immediately after opening the packaging.
   14. Do not use a swab if a break and/or hole are found on the packaging.
   15. Do not use a swab if stained, broken, or bent.
   16. Do not bend or curve the rod of the swab before collecting the specimen.
   17. Be careful not to break the rod of the swab or damage the collection site (mucosa) by applying too much force or pressing too hard when collecting specimen with a swab.
   18. An elastic-plastic rod is employed in swabs to reduce the burden of patients. However, on the other hand, the tip of the swab may not be reached to the inflamed region on the wall of the nasal cavity or you may not be able to rub the tip on the wall of the nasal cavity adequately to collect enough volume of virus antigens, even though the tip of the swab is reached to the inflamed region on the wall of the nasal cavity. Therefore, make sure the tip of the swab is reached to the wall of the nasal cavity to rub the inflamed region at the time of collecting mucous epidermis.
   19. After preparing the sample, be careful not to spatter the sample when removing the swab.
   20. If the amount of specimen collected is excessive or the specimen is highly viscous, the filter may become clogged, and adequate sample volume may not be dropped. In that case, collect a new specimen and perform the retest.
3) Precautions for waste disposal
   1. Handle liquid waste and used utensils by any of the following disinfection and sterilization methods as sample (specimen) may contain infectious material.
      a) Immerse in sodium hypochlorite solution (effective chlorine concentration of 1,000 ppm) for 1 hour or longer
      b) Immerse in 2% glutaraldehyde solution for 1 hour or longer
      c) Autoclave at 121℃ for 20 minutes or longer
   2. Regarding disposal of used reagents and utensils, dispose of them in accordance with the Local Regulation and Law of waste disposal.

[Storage·Expiry]

· Storage: 1−30 °C
· Expiry: 24 months (As indicated on the package)

[Reference]

NATIONAL INSTITUTE OF INFECTOUS DISEASES (JAPAN) :
Manual for the Detection of Pathogen 2019-nCoV Ver.2.9.1

Technical information
Telephone **+81-942-85-3845**

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