October 9, 2020

Faith Du, Regulatory Affairs Manager
Thermo Fisher Scientific, Inc.
5781 Van Allen Way
Carlsbad, CA 92008

Device:	TaqPath COVID-19 Combo Kit, which may be labeled as the TaqPath COVID-19 Combo Kit Advanced as described in this letter.
Company:	Thermo Fisher Scientific, Inc. (Thermo Fisher)
Indication:	This test is authorized for the following indications for use: Qualitative detection of nucleic acid from SARS-CoV-2 in upper respiratory specimens (such as nasopharyngeal, oropharyngeal, nasal, and mid-turbinate swabs, and nasopharyngeal aspirate) and bronchoalveolar lavage (BAL) specimens from individuals suspected of COVID-19 by their healthcare provider. This test is also authorized for use with the Everlywell COVID-19 Test Home Collection Kit for individuals to self-collect nasal swab specimens when determined by a healthcare provider to be appropriate based on results of a COVID-19 questionnaire. Emergency use of this test is limited to authorized laboratories.
Authorized Laboratories:	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 high complexity tests.

Dear Mrs. Du:

On March 13, 2020, based on your[1] request, the Food and Drug Administration (FDA) issued a letter authorizing the emergency use of the TaqPath COVID-19 Combo Kit for the qualitative detection of nucleic acid from SARS-CoV-2 in nasopharyngeal swab, nasopharyngeal aspirate, and bronchoalveolar lavage (BAL) specimens from individuals suspected of COVID-19 by their healthcare provider, pursuant to Section 564 of the Federal Food, Drug, and Cosmetic Act (the Act) (21 U.S.C. §360bbb-3). The TaqPath COVID-19 Combo Kit was authorized for use only

[1] For ease of reference, this letter will use the term "you" and related terms to refer to Thermo Fisher Scientific, Inc. (Thermo Fisher).

under Emergency Use Authorization (EUA) in the United States (U.S.) in laboratories certified under the Clinical Laboratory Improvement Amendments of 1988 (CLIA), 42 U.S.C. §263a, to perform high complexity tests. Based on your request, FDA has also granted updates to the authorized labeling on March 24, 2020[2], April 20, 2020[3], May 9, 2020[4], and July 17, 2020.[5]

On August 20, 2020, you requested to amend your EUA to, among other requests, add a workflow with increased purified RNA input volume, which you refer to as the High Sensitivity Workflow. Based on these requests, and having concluded that revising the March 13, 2020, EUA is appropriate to protect the public health or safety under section 564(g)(2)(C) of the Act (21 U.S.C. § 360bbb-3(g)(2)(C)), FDA is reissuing the March 13, 2020, letter in its entirety with the revisions incorporated.[6] Pursuant to section 564 of the Act and the Scope of Authorization (Section II) and Conditions of Authorization (Section IV) of this reissued letter, your product[7] is

[2] On March 24, 2020, your request was granted to update the Instructions for Use of your product to: (1) add manual sample extraction procedures using the MagMAX Viral/Pathogen Nucleic Acid Isolation Kit, (2) add the Applied Biosystems 7500 Fast system that utilizes DCS versions 1.5.1 and 2.3, (3) add Applied Biosystems COVID-19 Interpretive Software v1.1, and (4) include some format changes and minor edits to the Instructions for Use for clarification.

[3] On April 20, 2020, your request was granted to update the Instructions for Use of your product to: (1) add three real-time PCR instruments: Applied Biosystems 7500 Real-Time instrument, QuantStudio 5 with 0.1ml Block, and Quant Studio 5 with 0.2 ml Block, (2) add four extraction procedure modifications: automated extraction with MagMAX Viral/Pathogen Nucleic Acid Isolation Kit and 200 µl sample input volume, automated extraction with MagMAX Viral/Pathogen II Nucleic Acid Isolation Kit and 200 or 400 µl sample input volume, manual extraction with MagMAX Viral/Pathogen II Nucleic Acid Isolation Kit and 200 µl sample input volume (3) update the Applied Biosystems COVID-19 Interpretive Software to v1.2 and v2.0, (4) add oropharyngeal, nasal, and mid-turbinate swab specimen types to the Intended Use, and the associated limitation regarding the nasal and mid-turbinate swabs, (5) add endogenous interfering substances study (6) add protocols for the new real-time PCR instruments and extraction methods, and (7) include minor edits in the Instructions for Use for clarification.

[4] On May 9, 2020, your request was granted to update the Instructions for Use of your product to: (1) add Applied Biosystems QuantStudio 7 Flex Real-Time PCR system, 384-well (RUO) and Applied Biosystems QuantStudio 5 Real-Time PCR system 384-well (ROU) instruments, (2) add Applied Biosystems COVID-19 Interpretive Software v2.2, (3) add extraction procedure for MagMAX Viral/Pathogen II Nucleic Acid Isolation Kit for manual extraction using 400µl specimen input, (4) add protocols for the new real-time PCR instruments and extraction methods and revise some of the existing procedures for clarification, (5) add additional products as an alternative to the KingFisher 96 KF microplate for automated RNA extraction, (6) update specimen storage recommendations, (7) update limitations section regarding nasal and mid-turbinate swabs, (8) include additional minor edits in the Instructions for Use for clarification.

[5] On July 17, 2020, your request was granted to update the Instructions for Use of your product to: (1) extend the expiration dating for reagents based on the results from an Accelerated Stability Study, (2) update the in silico analysis of inclusivity, (3) revise the TaqPath COVID-19 Combo Kit interpretive software to address the potential for false-negative results and Positive Control failures, (4) update the device labelling for clarity and consistency with the modifications authorized under this amendment, in addition to some minor updates requested by FDA.

[6] The revisions to the March 13, 2020, letter and authorized labeling include: (1) revisions to the intended use and authorized labeling documents to authorize the use of this product with high volume workflows, (2) revisions to the intended use and authorized labeling documents to include testing of self-collected nasal swab samples using the Everlywell COVID-19 Test Home Collection Kit, including introduction of the TaqMan SARS-CoV-2 RNase P Assay to detect human RNase P nucleic acid as an endogenous control, and (3) revisions to the intended use, healthcare provider and patient fact sheets to reflect language more consistent with recent authorizations.

[7] For ease of reference, this letter will use the term "your product" to refer to the "TaqPath COVID-19 Combo Kit." For purposes of this EUA, the TaqPath COVID-19 Combo Kit may be labeled as the TaqPath COVID-19 Combo Kit Advanced when distributed and used with reagent volumes that have been optimized for "high volume" workflows that use 14.0 µL or 17.5 µL of purified sample RNA, which this test is authorized to use as described in Section II of this letter and the corresponding Instructions for Use.

now authorized for use consistent with the indication described above.

On February 4, 2020, pursuant to Section 564(b)(1)(C) of the Act, the Secretary of the Department of Health and Human Services (HHS) determined that there is a public health emergency that has a significant potential to affect national security or the health and security of United States citizens living abroad, and that involves the virus that causes COVID-19. Pursuant to Section 564 of the Act, and on the basis of such determination, the Secretary of HHS then declared that circumstances exist justifying the authorization of emergency use of in vitro diagnostics for detection and/or diagnosis of the virus that causes COVID-19 subject to the terms of any authorization issued under Section 564(a) of the Act.[8]

FDA considered the totality of scientific information available in authorizing the emergency use of your product for the indication above. A summary of the performance information FDA relied upon is contained in the Instructions for Use (identified below).

Having concluded that the criteria for issuance of this authorization under Section 564(c) of the Act are met, I am authorizing the emergency use of the your product as described in the Scope of Authorization (Section II)) in individuals suspected of COVID-19 by their healthcare provider for the detection of SARS-CoV-2 by authorized laboratories, subject to the terms of this authorization.

I. Criteria for Issuance of Authorization

I have concluded that the emergency use of your product meets the criteria for issuance of an authorization under Section 564(c) of the Act, because I have concluded that:

1. The SARS-CoV-2 can cause a serious or life-threatening disease or condition, including severe respiratory illness, to humans infected by this virus;

2. Based on the totality of scientific evidence available to FDA, it is reasonable to believe that your product may be effective in diagnosing COVID-19, and that the known and potential benefits your product, when used for diagnosing COVID-19, outweigh the known and potential risks of such product; and

3. There is no adequate, approved, and available alternative to the emergency use of your product for diagnosing COVID-19.[9]

II. Scope of Authorization

I have concluded, pursuant to Section 564(d)(1) of the Act, that the scope of this authorization is limited to the indication above.

[8] U.S. Department of Health and Human Services, *Determination of a Public Health Emergency and Declaration that Circumstances Exist Justifying Authorizations Pursuant to Section 564(b) of the Federal Food, Drug, and Cosmetic Act, 21 U.S.C.* § *360bbb-3*. 85 FR 7316 (February 7, 2020).
[9] No other criteria of issuance have been prescribed by regulation under Section 564(c)(4) of the Act.

The Authorized Product

Your product is authorized for the qualitative detection of nucleic acid from SARS-CoV-in upper respiratory specimens (such as nasopharyngeal, oropharyngeal, nasal, and mid-turbinate swabs, and nasopharyngeal aspirate) and bronchoalveolar lavage (BAL) specimens from individuals suspected of COVID-19 by their healthcare provider.

This test is also authorized for use with the Everlywell COVID-19 Test Home Collection Kit for individuals to self-collect nasal swab specimens when determined by a healthcare provider to be appropriate based on results of a COVID-19 questionnaire.

Testing is limited to laboratories certified under CLIA that meet requirements to perform high complexity tests.

The SARS-CoV-2 nucleic acid is generally detectable in upper respiratory and bronchoalveolar lavage (BAL) specimens during the acute phase of infection. Positive results are indicative of the presence of SARS-CoV-2 RNA; clinical correlation with patient history and other diagnostic information is necessary to determine patient infection status. Positive results do not rule out bacterial infection or co-infection with other viruses. The agent detected may not be the definite cause of disease. Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for patient management decisions. Negative results must be combined with clinical observations, patient history, and epidemiological information.

To use your product, SARS-CoV-2 nucleic acid is first extracted, isolated and purified from upper respiratory, or BAL specimens. The purified nucleic acid is then reverse transcribed into cDNA followed by PCR amplification and detection using an authorized real-time PCR instrument and interpretive software using various workflows outlined in the instructions for use. Your product includes the following materials or other authorized materials, in different amounts:

- TaqPath RT-PCR COVID-19 Kit - containing the COVID-19 Real Time PCR Assay Multiplex, that include the three primer/probe sets specific to different SARS- CoV-2 genomic regions (Gene Orf-1ab, N Protein, S Protein) and primers/probes for bacteriophage MS2, and the MS2 Phage Control reagent.
- TaqPath COVID-19 Control Kit – containing the TaqPath COVID-19 Control - RNA positive control that contains the SARS-CoV-2 genomic regions targeted by the kit and the TaqPath COVID-19 Control Dilution Buffer.

Your product requires the following control materials, or other authorized control materials, (as may be requested under Condition K. below) that are processed along with the patient samples when testing with you product. The controls listed below must generate expected results in order for a test to be considered valid, as outlined in the Instructions for Use:

- Internal Positive Control (IPC) – MS2 phage control which is required as an extraction, reverse transcription and PCR amplification positive control.
- External positive control - TaqPath COVID-19 Control contains the SARS-CoV-2 RNA genomic regions targeted by the kit. The positive control is used to monitor for

failures of rRT-PCR reagents and reaction conditions.
- Negative Control - molecular-grade, nuclease-free, non-DEPC-treated water used to monitor non-specific amplification, cross-contamination during experimental setup, and nucleic acid contamination of reagents.

Your product also requires the use of additional authorized materials and authorized ancillary reagents that are not included with your product and are described in the Instructions for Use, described below.

The labeling entitled "TaqPath COVID-19 Combo Kit and TaqPath COVID-19 Combo Kit Advanced Instructions for Use" and the "TaqPath COVID-19 Combo Kit and TaqPath COVID-19 Combo Kit Advanced Product Information Sheet" (available at https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use-authorizations-medical-devices/vitro-diagnostics-euas),
and the following fact sheets pertaining to the emergency use, which is required to be made available as set forth in the Conditions of Authorization (Section IV), are collectively referred to as "authorized labeling":

- Fact Sheet for Healthcare Providers: Thermo Fisher Scientific, Inc. - TaqPath COVID-19 Combo Kit and TaqPath COVID-19 Combo Kit Advanced
- Fact Sheet for Patients: Thermo Fisher Scientific, Inc. - TaqPath COVID-19 Combo Kit and TaqPath COVID-19 Combo Kit Advanced

The above described product, with the authorized labeling provided as set forth in the Conditions of Authorization (Section IV), is authorized to be distributed to and used by authorized laboratories under this EUA, despite the fact that it does not meet certain requirements otherwise required by applicable federal law.

I have concluded, pursuant to Section 564(d)(2) of the Act, that it is reasonable to believe that the known and potential benefits of your product, when used for the qualitative detection of SARS-CoV-2 and used consistent with the Scope of Authorization of this letter (Section II), outweigh the known and potential risks of your product.

I have concluded, pursuant to Section 564(d)(3) of the Act, based on the totality of scientific evidence available to FDA, that it is reasonable to believe that your product may be effective in diagnosing COVID-19, when used consistent with the Scope of Authorization of this letter (Section II), pursuant to Section 564(c)(2)(A) of the Act.

FDA has reviewed the scientific information available to FDA, including the information supporting the conclusions described in Section I above, and concludes that your product (as described in the Scope of Authorization of this letter (Section II)), meets the criteria set forth in Section 564(c) of the Act concerning safety and potential effectiveness.

The emergency use of your product under this EUA must be consistent with, and may not exceed, the terms of this letter, including the Scope of Authorization (Section II) and the Conditions of Authorization (Section IV). Subject to the terms of this EUA and under the

circumstances set forth in the Secretary of HHS's determination under Section 564(b)(1)(C) of the Act described above and the Secretary of HHS's corresponding declaration under Section 564(b)(1) of the Act, your product is authorized for the indication above.

III. Waiver of Certain Requirements

I am waiving the following requirements for the TaqPath COVID-19 Combo Kit during the duration of this EUA:

- Current good manufacturing practice requirements, including the quality system requirements under 21 CFR Part 820 with respect to the design, manufacture, packaging, labeling, storage, and distribution of your product, but excluding Subpart H (Acceptance Activities, 21 CFR 820.80 and 21 CFR 820.86), Subpart I (Nonconforming Product, 21 CFR 820.90), and Subpart O (Statistical Techniques, 21 CFR 820.250).

IV. Conditions of Authorization

Pursuant to Section 564(e) of the Act, I am establishing the following conditions on this authorization:

Thermo Fisher (You) and Its Authorized Distributor(s) [10]

A. Your products must comply with the following labeling requirements under FDA regulations: the intended use statement (21 CFR 809.10(a)(2), (b)(2)); adequate directions for use (21 U.S.C. 352(f)), (21 CFR 809.10(b)(5), (7), and (8)); any appropriate limitations on the use of the device including information required under 21 CFR 809.10(a)(4); and any available information regarding performance of the device, including requirements under 21 CFR 809.10(b)(12).

B. Thermo Fisher and its authorized distributor(s) will make available the authorized labeling to authorized laboratories.

C. You and authorized distributor(s) will make available on your website(s) the authorized labeling.

D. You and authorized distributor(s) will include a physical copy of the authorized Product Information Sheet with each shipped product to authorized laboratories, and will make the authorized Instructions for Use electronically available. Authorized laboratories may request a copy of the Instructions for Use in paper form, and after such request, you must promptly provide the requested information without additional cost.

E. You and authorized distributor(s) will inform authorized laboratories and relevant public health authorities of this EUA, including the terms and conditions herein, and

[10] "Authorized Distributor(s)" are identified by you, Thermo Fisher, in your EUA submission as an entity allowed to distribute your product.

any updates made to the TaqPath COVID-19 Combo Kit and TaqPath COVID-19 Combo Kit Advanced and/or authorized labeling.

F. Through a process of inventory control, you and authorized distributor(s) will maintain records of the authorized laboratories to which they distribute the test and number of tests they distribute.

G. You and authorized distributor(s) will collect information on the performance of the test. You will report to FDA any suspected occurrence of false positive and false negative results and significant deviations from the established performance characteristics of the test of which you become aware.

H. You and authorized distributor(s) are authorized to make available additional information relating to the emergency use of the authorized TaqPath COVID-19 Combo Kit that is consistent with, and does not exceed, the terms of this letter of authorization.

Thermo Fisher (You)

I. You will notify FDA of any authorized distributor(s) of your product, including the name, address, and phone number of any authorized distributor(s).

J. You will provide its authorized distributor(s) with a copy of this EUA and communicate to its authorized distributor(s) any subsequent amendments that might be made to this EUA and its authorized accompanying materials (e.g., Fact Sheets).

K. You may request changes to this EUA for your product, including to the Scope of Authorization (Section II in this letter) or to the authorized labeling, including requests to make available additional authorized labeling specific to an authorized distributor. Such additional labeling may use another name for the product but otherwise must be consistent with the authorized labeling, and not exceed the terms of authorization of this letter. Any request for changes to this EUA should be submitted to the Division of Microbiology (DMD)/Office of Health Technology 7 (OHT7)-Office of In Vitro Diagnostics and Radiological Health (OIR)/Office of Product Evaluation and Quality (OPEQ)/Center for Devices and Radiological Health (CDRH) and require appropriate authorization from FDA prior to implementation.

L. You will comply with the following requirements pursuant to FDA regulations: Subpart H (Acceptance Activities, 21 CFR 820.80 and 21 CFR 820.86), Subpart I (Nonconforming Product, 21 CFR 820.90), and Subpart O (Statistical Techniques, 21 CFR 820.250).

M. You must have lot release procedures and the lot release procedures, including the study design and statistical power, must ensure that the tests released for distribution have the clinical and analytical performance claimed in the authorized labeling.

N. If requested by FDA, you must submit lot release procedures to FDA, including sampling protocols, testing protocols, and acceptance criteria, that you use to release lots of your products for distribution in the U.S. If such lot release procedures are requested by FDA, you must provide it within 48 hours of the request.

O. You will evaluate the analytical limit of detection and assess traceability[11] of your products with any FDA-recommended reference material(s). After submission to and concurrence with the date by FDA you will update your labeling to reflect the additional testing. Such labeling updates will be made in consultation with, and require concurrence of, DMD/OHT7-OIR/OPEQ/CDRH.

P. You will submit to FDA a summary report within 30 calendar days of authorization summarizing the results of any testing performed using specimens collected with any new home-collection kit authorized for use with your product, including how many specimens were received, how many specimens had to be rejected during accession and the main reasons for rejection, and the positivity rate for specimens collected with the authorized home-collection kit.

Q. You will have a process in place to track adverse events associated with the Everlywell COVID-19 Test Home Collection Kit, or any other home specimen collection kit authorized for use with your product, including occurrences of false results and report to FDA pursuant to 21 CFR Part 803. Serious adverse events, especially unexpected biosafety concerns, should immediately be reported to DMD/OHT7-OIR/OPEQ/CDRH (via email: CDRH-EUA-Reporting@fda.hhs.gov).

R. You will have a process in place in accordance with 21 CFR Part 803 to track adverse events, including any occurrence of false results and report to FDA pursuant to 21 CFR Part 803.

Authorized Laboratories

S. 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.

T. 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 extraction methods, authorized clinical specimen types, authorized control materials, authorized other ancillary reagents and authorized materials required to use your product are not permitted.

U. Authorized laboratories that receive your product will notify the relevant public health authorities of their intent to run the test prior to initiating testing.

[11] Traceability refers to tracing analytical sensitivity/reactivity back to an FDA-recommended reference material.

V. 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.

W. Authorized laboratories will collect information on the performance of the test and report to DMD/OHT7-OIR/OPEQ/CDRH (via email: CDRH-EUA-Reporting@fda.hhs.gov) and you (1-800-955-6288 or techservices@thermofisher.com) any suspected occurrence of false positive or false negative results and significant deviations from the established performance characteristics of the test of which they become aware.

X. All laboratory personnel using the test must be appropriately trained in RT-PCR techniques and use appropriate laboratory and personal protective equipment when handling this kit, and use the test in accordance with the authorized labeling.

Thermo Fisher (You), Its Authorized Distributor(s), and Authorized Laboratories

Y. You, authorized distributor(s) 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.

Conditions Related to Printed Materials, Advertising and Promotion

Z. All descriptive printed matter, including advertising and promotional materials, relating to the use of your product shall be consistent with the authorized labeling, as well as the terms set forth in this EUA and the applicable requirements set forth in the Act and FDA regulations.

AA. No descriptive printed matter, including advertising or promotional materials, relating to the use of your product may represent or suggest that this test is safe or effective for the detection of SARS-CoV-2.

BB. No descriptive printed matter, including advertising and promotional materials, relating to the use of your product shall clearly and conspicuously state that:

- This test has not been FDA cleared or approved;
- This test has been authorized by FDA under an EUA for use by authorized laboratories;
- This test has been authorized only for the detection of nucleic acid from SARS-CoV-2, not for any other viruses or pathogens; and
- 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 Federal

Food, Drug, and Cosmetic Act, 21 U.S.C. § 360bbb-3(b)(1), unless the authorization is terminated or revoked sooner.

The emergency use of your product as described in this letter of authorization must comply with the conditions and all other terms of this authorization.

V. Duration of Authorization

This EUA will be effective until the declaration that circumstances exist justifying the authorization of the emergency use of in vitro diagnostics for detection and/or diagnosis of COVID-19 is terminated under Section 564(b)(2) of the Act or the EUA is revoked under Section 564(g) of the Act.

Sincerely,

Denise M. Hinton -S3

Digitally signed by Denise M. Hinton -S3
Date: 2020.10.09 12:59:41 -04'00'

RADM Denise M. Hinton
Chief Scientist
Food and Drug Administration

Enclosure