510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION
DECISION SUMMARY
ASSAY AND INSTRUMENT

I Background Information:

A 510(k) Number

K240867

B Applicant

Roche Molecular Systems, Inc.

C Proprietary and Established Names

cobas SARS-CoV-2 Qualitative for use on the cobas 5800/6800/8800 Systems

D Regulatory Information

Product Code(s)	Classification	Regulation Section	Panel
QQX	Class II	21 CFR 866.3981 - Device To Detect And Identify Nucleic Acid Targets In Respiratory Specimens From Microbial Agents That Cause The SARS-CoV-2 Respiratory Infection And Other Microbial Agents When In A Multi-Target Test	MI - Microbiology

II Submission/Device Overview:

A Purpose for Submission:

The purpose of this submission is to expand the intended use of cobas SARS-CoV-2 Qualitative for use on the cobas 5800/6800/8800 Systems, which was originally FDA-cleared under K231306 to include asymptomatic population.

B Measurand:

SARS-CoV-2 RNA

C Type of Test:

Real-time nucleic acid amplification test

III Intended Use/Indications for Use:

A Intended Use(s):
See Indications for Use below.

B Indication(s) for Use:
cobas SARS-CoV-2 Qualitative for use on the cobas 5800/6800/8800 Systems is a real-time RT-PCR test intended for the qualitative detection of nucleic acids from SARS-CoV-2 in nasopharyngeal swab specimens collected from individuals with signs and symptoms of COVID-19 and in anterior nasal swab specimens collected from any individuals with or without signs and symptoms of COVID-19.

Positive results are indicative of the presence of SARS-CoV-2 RNA. Positive results do not rule out bacterial infection or co-infection with other pathogens.

Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for patient management decisions. Results are meant to be used in conjunction with clinical observations, patient history, recent exposures, epidemiological information, and laboratory data, in accordance with the guidelines provided by the relevant public health authorities.

C Special Conditions for Use Statement(s):
Rx - For Prescription Use Only

IVD - For in vitro diagnostic use

D Special Instrument Requirements:
For use with the cobas 5800/6800/8800 Systems.

IV Device/System Characteristics:

A Device Description:
The cobas SARS-CoV-2 Qualitative for use on the cobas 5800/6800/8800 Systems is a fully automated test system including sample preparation (nucleic acid extraction and purification) followed by PCR amplification and detection. The cobas 5800/6800/8800 Systems consists of three separate instruments, the cobas 5800 System, the cobas 6800 System and the cobas 8800 System, which allow users to perform multiple PCR-based in vitro nucleic acid amplification tests. The cobas 5800/6800/8800 Systems consist of the sample supply module, the transfer module, the processing module, and the analytic module. Automated data management is performed by the cobas 5800/6800/8800 Systems software(s), which assigns test results for all tests. Results can be reviewed directly on the system screen and printed as a report.

Nucleic acid from patient samples and added internal control RNA (RNA IC) molecules are simultaneously extracted. Nucleic acid is released by addition of proteinase and lysis reagent to the sample. The released nucleic acid binds to the silica surface of the added magnetic glass particles. Unbound substances and impurities, such as denatured protein, cellular debris, and potential PCR inhibitors, are removed with subsequent wash steps and purified nucleic acid is

eluted from the magnetic glass particles with elution buffer at elevated temperature. External controls (positive and negative) are processed in the same way.

Selective amplification of target nucleic acid from the sample is achieved using target specific forward and reverse primers for ORF1 a/b non-structural region that is unique to SARS- CoV-2. Additionally, a conserved region in the structural protein envelope E-gene were chosen for pan-Sarbecovirus detection. The pan-Sarbecovirus detection sets will also detect SARS-CoV- 2 virus. Selective amplification of RNA IC is achieved using non-competitive sequence specific forward and reverse primers which have no homology with the coronavirus genome. A thermostable DNA polymerase enzyme is used for amplification. For more details, refer to K213804 and K231306.

B Principle of Operation:
Same as K213804 and K231306

V Substantial Equivalence Information:

A Predicate Device Name(s):
cobas SARS-CoV-2 Qualitative for use on the cobas 5800/6800/8800 Systems

B Predicate 510(k) Number(s):
K231306

C Comparison with Predicate(s):

	Submitted Device: cobas SARS-CoV-2 Qualitative (K240867)	**Predicate Device: cobas SARS-CoV-2 Qualitative (K231306)**
Regulation Number	21 CFR 866.3981	Same
Regulation Name	Device to detect and identify nucleic acid targets in respiratory specimens from microbial agents that cause the SARS-CoV-2 respiratory infection and other microbial agents when in a multi-target test	Same
Product Code	QQX	Same
Intended Use	cobas SARS-CoV-2 Qualitative for use on the cobas 5800/6800/8800 Systems is a real- time RT-PCR test intended for the qualitative detection of nucleic acids from SARS-CoV-2 in nasopharyngeal swab specimens collected from individuals with signs and symptoms of COVID-19 and in anterior nasal swab specimens collected from any individuals with or without signs and symptoms of COVID-19. Positive results are indicative of the presence of SARS-CoV-2 RNA. Positive results do not rule out bacterial infection or co-infection with other pathogens.	cobas SARS-CoV-2 Qualitative for use on the cobas 5800/6800/8800 Systems is a real-time RT-PCR test intended for the qualitative detection of nucleic acids from SARS-CoV-2 in nasal and nasopharyngeal specimens collected from symptomatic individuals suspected of COVID-19 by their healthcare provider. Results are for the detection of SARS-CoV-2 RNA. 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

	Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for patient management decisions. Results are meant to be used in conjunction with clinical observations, patient history, recent exposures, epidemiological information, and laboratory data, in accordance with the guidelines provided by the relevant public health authorities.	results do not rule out bacterial infection or co-infection with other pathogens. Negative results do not preclude SARS-CoV-2 infection and should not be used as the sole basis for patient management decisions. Results are meant to be used in conjunction with clinical observations, patient history, recent exposures and epidemiological information, and laboratory data, in accordance with the guidelines provided by the relevant public health authorities. cobas SARS-CoV-2 Qualitative is intended for use by qualified clinical laboratory personnel specifically instructed and trained in the techniques of real-time PCR and on the use of the cobas 5800/6800/8800 Systems.
Conditions for use	For prescription use	Same
Sample Types	Nasopharyngeal swab specimen Anterior Nasal swab specimen	Same
Analyte Targets	SARS-CoV-2	Same
Sample Preparation Procedure	Automated by cobas 5800/6800/8800 Systems	Same
Amplification Technology	Real-time PCR	Same
Detection Chemistry	Paired reporter and quencher fluorescence labeled probes (TaqMan Technology) using fluorescence resonance energy transfer (FRET)	Same
Controls used	Sample processing control (IC) Positive and negative control	Same
Result Analysis	Based on PCR cycle threshold analysis	Same

VI Standards/Guidance Documents Referenced:

Class II Special Controls as per 21 CFR 866.3981.

VII Performance Characteristics (if/when applicable):

A Analytical Performance:

1. Precision/Reproducibility:

Precision/Reproducibility were previously reviewed and described in K213804.

2. Linearity:

Not applicable

3. Analytical Specificity/Interference:

An updated *in-silico* analysis was performed in January 2025 using all SARS-CoV-2 sequences submitted to the GISAID database till date (as of January 15, 2025) and are reported in Table 1 below. The *in-silico* analysis results indicate that >99.9% of sequences for SARS-CoV-2 have no changes in primer/probe binding sites at both target regions simultaneously. All sequences are predicted to be detected by at least one of the two target regions.

Table 1: Updated *in silico* analysis of SARS-CoV-2 Qualitative Oligo Design

Target	Orf1ab		E-gene		Orf1ab & E-gene	
Database	GISAID		GISAID		GISAID	
total	16156883	100.00%	16156883	100.00%	16156883	100.00%
with_mismatch	549763	3.40%	87773	0.54%	3560	0.02%
dCp>5 or Tm<65	545	0.00%	1175	0.01%	3*	0.00%

* The three sequences have several frameshifts, significantly long truncations and nucleotide gaps, and thus are considered submissions of lower sequencing quality.

4. Assay Reportable Range:
Not Applicable

5. Traceability, Stability, Expected Values (Controls, Calibrators, or Methods):
Same as K213804

6. Detection Limit:
Same as K213804

7. Assay Cut-Off:
Same as K213804

B Comparison Studies:

1. Method Comparison with Predicate Device:
Not Applicable

2. Matrix Comparison:
Same as K213804

C Clinical Studies:

Symptomatic Population
The clinical performance of cobas SARS-CoV-2 Qualitative in symptomatic population using anterior nasal swab and nasopharyngeal swab specimens was previously reviewed and described in K213804.

Asymptomatic Population
The clinical performance of the cobas SARS-CoV-2 Qualitative with asymptomatic subjects was assessed using real-world data (RWD) from the National Football League (NFL) COVID-19 Surveillance Program and a prospective clinical study called Test Us at Home (TUAH).

Real-World evidence (NFL surveillance program)
The clinical performance of the cobas SARS-CoV-2 Qualitative with asymptomatic subjects was assessed using real-world data collected from the 2020 National Football League (NFL) COVID-19 Surveillance Program where samples were collected and tested between August 2020-January 2021 as part of an Occupational Testing protocol. Anterior nasal swab samples were prospectively collected on a near-daily basis from NFL players and staff.

The performance of cobas SARS-CoV-2 Qualitative were estimated using comparator algorithm that was based on molecular comparator test results and/or clinical adjudication performed within the NFL testing program. A total of 1776 samples were selected for analysis where the cobas SARS-CoV-2 Qualitative candidate test, and comparator test results, were evaluable to establish the COVID-19 status for each sample. The results are shown below.

Table 2 Performance estimates for the cobas SARS-CoV-2 Qualitative in anterior nasal swabs in asymptomatic individuals (NFL).

Cobas SARS-CoV-2 Qualitative	Comparator algorithm		Total
	Positive	Negative	
Positive	11	3	14
Negative	0	1,762	1,762
Total	11	1,765	1,776
PPA (n/N) (95% Confidence Interval)	100.0 % (11/11) (95% CI: 74.1% - 100%)		
NPA (n/N) (95% Confidence Interval)	99.8% (1762/1765) (95% CI: 99.5% - 99.9%)		

Note: CI = confidence interval, PPA = positive percent agreement, NPA = negative percent agreement

Clinical Study
The clinical performance of the cobas SARS-CoV-2 Qualitative with asymptomatic subjects was also assessed using data collected from the 2021 Test Us at Home (TUAH) study where samples were collected and tested for SARS-CoV-2 between October 2021 and April 2022 as part of a longitudinal study. Anterior nasal swab samples were prospectively collected every 48 hours from each participant over 15 days.

The performance of cobas SARS-CoV-2 Qualitative was estimated using a comparator algorithm where two consecutive test results (molecular test) over 48 hours were used to determine comparator result. All samples (38,185) from the TUAH study that had a valid comparator algorithm and a valid candidate test result were included in the calculation of performance estimates of the cobas SARS-CoV-2 Qualitative. The results are shown in table below.

Table 3. Performance estimates for the cobas SARS-CoV-2 Qualitative in anterior nasal swabs in asymptomatic individuals in (TUAH study).

Cobas SARS-CoV-2 Qualitative	Comparator algorithm		Total
	Positive	Negative	
Positive	315	272	587
Negative	19	37,586	37,605
Total	334	37,858	38,192
PPA (n/N) (95% Confidence Interval)	94.3% (315/334) (95% CI: 91.4% - 96.8%) *		

NPA (n/N) (95% Confidence Interval)	99.2% (37,586/37,858) (95% CI: 99.2% - 99.4%) *

* Confidence intervals were estimated using a bootstrapping method.
Note: CI = confidence interval, PPA = positive percent agreement, NPA = negative percent agreement

D Clinical Cut-Off:
Not applicable

E Expected Values/Reference Range:
The clinical performance of cobas SARS-CoV-2 Qualitative in asymptomatic population was evaluated in a prospective clinical study between October 2021 and April 2022. The positivity rate for the detection of SARS-CoV-2 by the cobas SARS-CoV-2 Qualitative was 1.8% for asymptomatic anterior nasal swab specimens.

VIII Proposed Labeling:
The labeling supports the finding of substantial equivalence for this device.

IX Conclusion:
The submitted information in this premarket notification is complete and supports a substantial equivalence decision.