Automation of the Illumina® COVIDseq™ Test on the epMotion® Liquid Handler

Rapid and Flexible Library Preparation for SARS-CoV-2 Research

Viral sequencing has become an important and powerful tool in identifying SARS-CoV-2 mutations and studying sources of infection.

At Eppendorf, we have developed pre-qualified methods for the Illumina® COVIDseq™ Test (RUO version) on the epMotion® 5075t NGS Solution* to help you easily automate your library preparation for viral genome analysis.

Product features

> Up to 15 ANSI/SLAS worktable positions

> Automatic exchange of 4 dispensing tools

> Maximum pipetting accuracy from 0.2 to 1,000 µL

> Optical sensor for detecting labware, liquids, tips

> Integrated Eppendorf ThermoMixer®* and up to 2 thermal modules for mixing and temperature control

> UV lamp and HEPA filter system option for decontamination and clean air conditions

> Email notification and integrated LED lights for visual feedback on system status
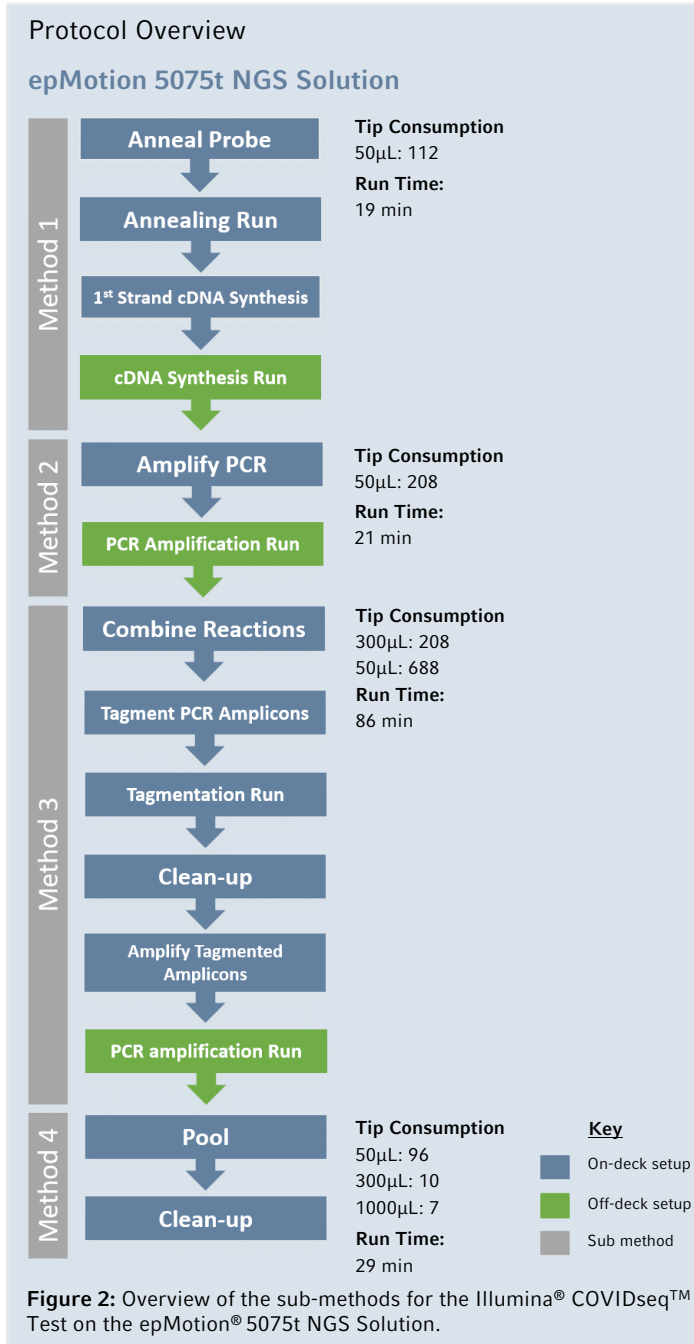
Your advantages

> **Scalable:** Configurable for batch sizes from 1 – 96 samples to meet your throughput needs

> **Accurate:** Generate high-quality and reliable libraries with proper size distribution

> **Highly flexible:** Large worktable supports a variety of tube and plate formats

> **Reliable:** Optical sensor checks reagents and consumables prior to each run for error-free set up

> **Cost-effective:** Automatic liquid level detection reduces any dead volume to save on reagent costs

> **Dynamic:** Runs can be started at any step to automate specific time-consuming and error-prone liquid handling steps

> **Efficient:** Interrupted runs can be restored from the point where they stopped to improve productivity

> **Safe:** Fully autoclavable dispensing tools, optional UV lamp and HEPA filter minimize cross-contamination

*For research use only

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Workflow Overview

Viral RNA Extraction	Library Preparation	Amplify Library	Pool & Clean-up	QC & Normalization	Pool & Dilute Libraries	Sequencing & Data Analysis

Figure 1: Automated workflow for the Illumina® COVIDseq™ Test on the epMotion® 5075t NGS Solution. Steps shown in brown can be automated on the epMotion® liquid handler.

Protocol Overview

epMotion 5075t NGS Solution

Method 1

- Anneal Probe
- Annealing Run
- 1st Strand cDNA Synthesis
- cDNA Synthesis Run

Tip Consumption
50µL: 112

Run Time:
19 min

Method 2

- Amplify PCR
- PCR Amplification Run

Tip Consumption
50µL: 208

Run Time:
21 min

Method 3

- Combine Reactions
- Tagment PCR Amplicons
- Tagmentation Run
- Clean-up
- Amplify Tagmented Amplicons
- PCR amplification Run

Tip Consumption
300µL: 208
50µL: 688

Run Time:
86 min

Method 4

- Pool
- Clean-up

Tip Consumption
50µL: 96
300µL: 10
1000µL: 7

Run Time:
29 min

Key
- On-deck setup (blue)
- Off-deck setup (green)
- Sub method (grey)

Figure 2: Overview of the sub-methods for the Illumina® COVIDseq™ Test on the epMotion® 5075t NGS Solution.
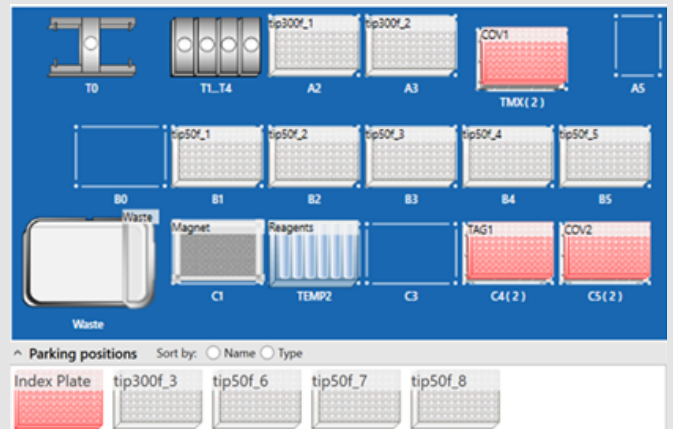
Worktable Configuration

Figure 3: Worktable layout for processing Method 3 on the epMotion® 5075t NGS Solution.
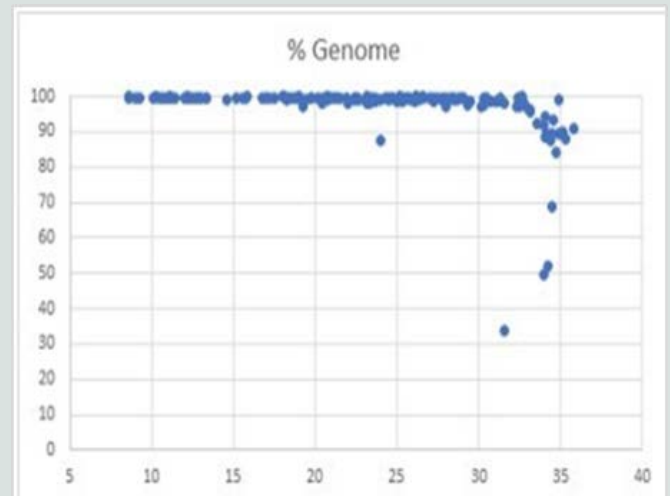
Application Data

Figure 4: Concentration of the final pooled library analyzed using the Qubit. Plot shows the relationship between sample Ct value and coverage.

The concentration of pooled libraries prepared on the epMotion was determined with the 1X dsDNA High Sensitivity kit on the Qubit 4 Fluorometer. On average the concentration of the final pooled library is approximately 50 ng/uL. This concentration can vary depending on sample quality and viral RNA load. Pooled libraries were sequenced on the Illumina NovaSeq (paired-end 150), with at least 1 million reads/sample. Plot shows the relationship between sample Ct value and coverage. The relation between Ct value and coverage is dependent on various factors including the sample quality, COVIDSeq primers, sequencing depth, etc.[1]

Acknowledgment

Contact your sales specialist for more information:

www.eppendorf.com/automation