MDx1500 - qPCR

AUTOMATION OF qPCR

RT-qPCR analysis of genomic and genetic samples has become a standard in genetic research and diagnostics. With the increased usage and acceptance of this analytical approach has come the need to increase sample analysis and throughput along with improved performance.

Different areas of qPCR workflow which can be addressed with the BioDot technology include: qPCR reaction make-up, sample distribution, and reaction miniaturization.

In order to achieve the accuracy and volume requirements dictated by low volume qPCR applications, BioJet Plus has been used to dispense primers, samples and mastermix.

Use of the BioDot technologies and approaches enable increased sample throughput through increased parallelization of sample and reactions, and reduced test costs through miniaturization of reaction test volumes.

With the BioDot dispensing systems, improved accuracy and test performance is achieved through greater control and precision of the qPCR workflow.

FEATURES AND BENEFITS

- High Density, Digital Formats
- Less Than 1 µL Reaction Volumes
- Low Volume 384, 1536, and greater
- Fully Automated Sample/Primer Loading
- Reduce Cost Per Reaction

LOW VOLUME OIL DISPENSING

- Enables Total Reaction Volumes below 1 µL
- Dispense 50 nL - 4 µL of Oil per well
- Eliminate Evaporation with Oil Capping
- Improve Reaction Performance
- Lower Reaction CV
- High Speed, Non-contact dispensing

PERFORMANCE OF THE MDx1500 - qPCR

Accuracy of Dispense Volume

- ±5% of Target

Precision of Dispense Volume

- ≤10% CV at 20 nL

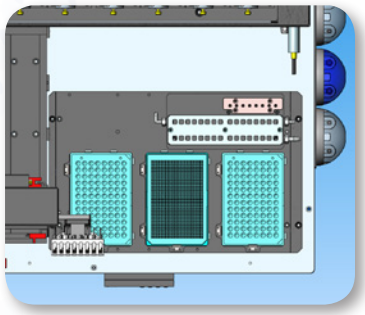
Total System Positional Accuracy

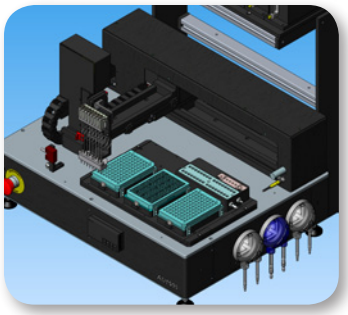
- ±150 µm (typically ±75 µm)
- SD 50 µm (typically ≤ 25 µm)

Humidity

- 60 ± 5% RH

MDx1500 - qPCR





LOW VOLUME PCR: DISPENSING THROUGH OIL

Deposit a layer of oil into a well and then dispense a reagent through the layer. Reaction then takes place beneath the oil layer. This process is used to address evaporative issues associated with low volume dispensing.

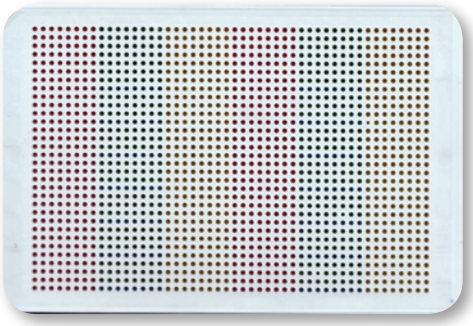
Experiment using silicon oil as a protective layer:

- 50 nL of mineral oil is deposited.
- Chip is centrifuged to ensure air is removed.
- Regent is dispensed with a 200 µm offset from the center of the well.
- Reagent enters well between the oil and the side of the well.
- Chip is centrifuged to force reagent to bottom of the well.
- Chip heated to 100°C to simulated heating cycle.

384-WELL PLATE

Simulated Reaction

- 1 µL total volume reaction under 1 µL oil “cap”.
- Primer/Template was simulated via yellow dye, 500 nL dispensed per well.
- Oligo/Sample was simulated via red, blue, and yellow dyes, 500 nL dispensed per well.
- The Oligo/Sample sequence was red, blue, yellow.



1536-WELL PLATE

Simulated Reaction

- 1 µL total volume reaction under 1 µL oil “cap”.
- Primer/Template was simulated via yellow dye, 500 nL dispensed per well.
- Oligo/Sample was simulated via red, blue, and yellow dyes, 500 nL dispensed per well.
- The Oligo/Sample sequence was red, blue, yellow, red, blue, yellow.
- Water (without yellow dye) Oligo/Sample was dispensed into the following rows to indicate template dispensing: A8, A12, A16, A20, A24, A28, A32.

BIODOT

Headquarters: 2852 Alton Pkwy • Irvine, CA 92606
t: +1 949-440-3685 • f: +1 949-440-3694 • www.biodot.com