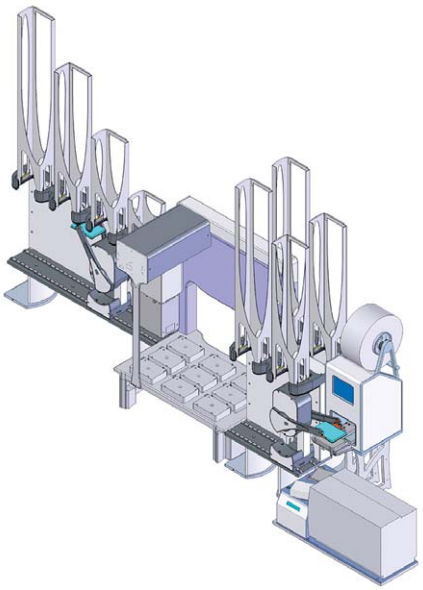
Agilent Microplate Replication Workstation

Application Bulletin



Agilent Microplate Replication Workstation consisting of an Agilent PlateLoc Thermal Microplate Sealer (right, top), an Agilent Microplate Barcode Labeler (right, bottom), an Agilent BenchCel Microplate Handling Workstation, each with four stackers (left), two more BenchCel Microplate Handling Workstations, each with two stackers (right, front and back), and an Agilent Bravo Automated Liquid Handling Platform (center).

Summary

- High-throughput workstation for microplate replication
- Flexible in accommodating a variety of microplate replication procedures
- Microplate processing time is approximately 3 hours for 50 source microplates and 250 destination microplates

Introduction

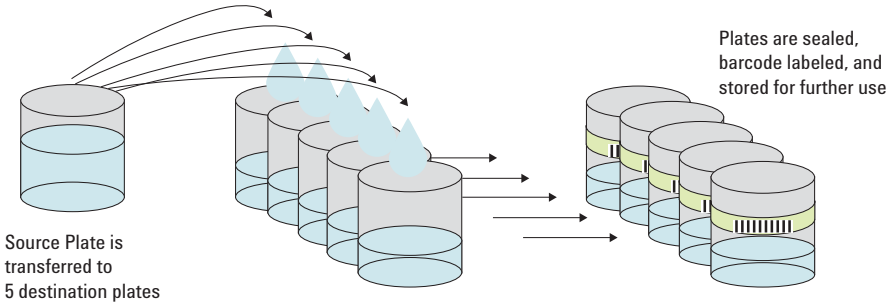
Microplate replication is one of the main tasks in compound management facilities. Because of the large quantities of microplates that must be processed, it is a labor-intensive task that is ideally suited for automation. In addition to increasing throughput, automating the task maximizes reliability.

System Description

To increase microplate capacity, an Agilent Bravo Platform is integrated with three Agilent BenchCel Workstations. To ensure maximum throughput, three drop-off locations on the Bravo deck enable independent and simultaneous delivery and retrieval of microplates. Tips can be washed while microplates are transported or sealed. Microplates are replicated on a 1:5 ratio (the system easily adjusts to other ratios), and tips are changed after each set of microplates. The barcode reader on the Bravo Platform recognizes the code on the source microplate, and the Agilent Microplate Barcode Labeler applies labels with the identical (or related) barcode on the destination microplates. The workstation has storage capacity for 50 source microplates, 50 destination microplates, and 50 tipboxes. The estimated throughput of the outlined protocol is 3 hours for a set of 50 source microplates and 250 destination microplates.

Agilent VWorks Automation Control software manages all processes to ensure reliable and repeatable results. Drag-and-drop protocol creation and modification is simple using the VWorks software, which schedules all of the necessary steps to allow simultaneous microplate processing for optimal throughput.

This application bulletin outlines a protocol using the Agilent Microplate Replication Workstation.



Overview of the microplate replication procedure

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Materials

Component List

- Two Agilent BenchCel Workstations (R-Series with two stackers)
- One BenchCel Workstation (R-Series with four stackers)
- Agilent Bravo Platform with gripper, 96LT disposable-tip pipette head, recirculating reservoir, barcode reader, tip trash bin
- Agilent PlateLoc Sealer
- Agilent Microplate Barcode Labeler

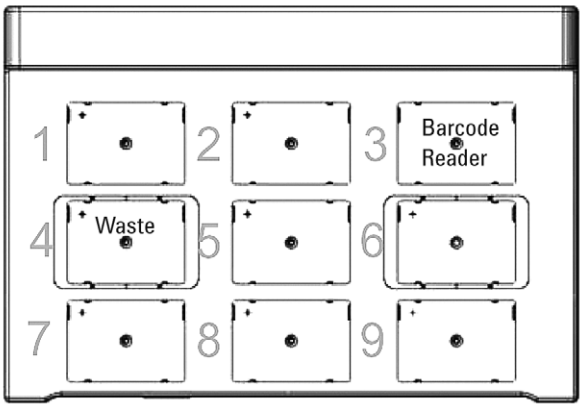
Labware List

- Microplate A: Greiner 96 PP
- Microplate B, 1-5: Greiner 96 PS
- Tipbox A: Agilent Tips 96LT 200 µL

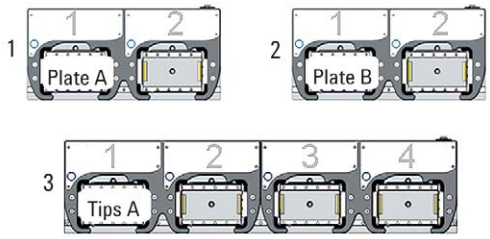
Protocol Workflow

1. Move Tipbox A from BenchCel 3 stacker 1 to Bravo deck location 1.
2. Press on tips at Bravo deck location 1.
3. Move Microplate A from BenchCel 1 stacker 1 to Bravo deck location 3.
4. Move microlate B from BenchCel 2 stacker 1 to Bravo deck location 9.
5. Transfer 5 µL from microplate A to microplate B.
6. Move microplate B from Bravo deck location 9 to the PlateLoc Sealer.
7. At the PlateLoc Sealer, seal microplate B.
8. Move microplate B from the PlateLoc Sealer to the Microplate Barcode Labeler.
9. At the Microplate Barcode Labeler, apply a barcode to microplate B.
10. Move microplate B from the Microplate Barcode Labeler to BenchCel 2 stacker 2.
11. Repeat steps 4 through 10 four more times to produce five destination microplates.
12. Remove tips at Bravo deck location 4.
13. Move Tipbox A from Bravo deck location 1 to BenchCel 3 stacker 4.
14. Move microplate A from Bravo deck location 3 to BenchCel 1 stacker 2.

Instrument Layout



Agilent Bravo deck (top view): location 3 has a barcode reader, location 4 has a tip trash bin.



BenchCel stackers (top view): (1) stacker 1 contains the source microplates, (2) stacker 1 contains the destination microplates, (3) stacker 1 contains the tipboxes.

Conclusions

The Agilent Microplate Replication Workstation provides simultaneous delivery of source microplate, destination microplate, and tips to the Bravo Platform. Source-to-destination microplate ratios can easily be modified, and tipboxes can be washed and re-used or disposed of after each use. The integrated PlateLoc Sealer facilitates microplate sealing to ensure maximum sample protection, and the Microplate Barcode Labeler enables secure barcode reading and printing. Depending on liquid-handling protocol, up to 250 destination microplates can be produced from 50 source microplates within 3 hours.

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