

# Технические характеристики

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# Meet the Agilent Bravo Automated Liquid Handling Platform

Achieve accurate and precise pipetting over a wide volume range to improve your data quality and consistency. The Bravo automated liquid handling platform has the versatility and scalability to provide you with an extensive choice of configurations and a unique, open design that assists integration into existing workflows in your laboratory. Incorporating the Bravo platform into your research will minimize the hours spent manually setting up and running complex applications.



Agilent Bravo automated liquid handling platform on risers

## High-accuracy liquid handling heads

Accurately, reliably, and reproducibly dispense 100 nL to 250  $\mu$ L into 96-, 384-, and 1536-well plates.

## 9-deck positions

An open, integration-friendly design that delivers maximum versatility for shaking, heating, cooling, and filtration.

## On-deck accessories

Configure the Bravo platform using custom settings for your applications.

## Available in two space-saving models

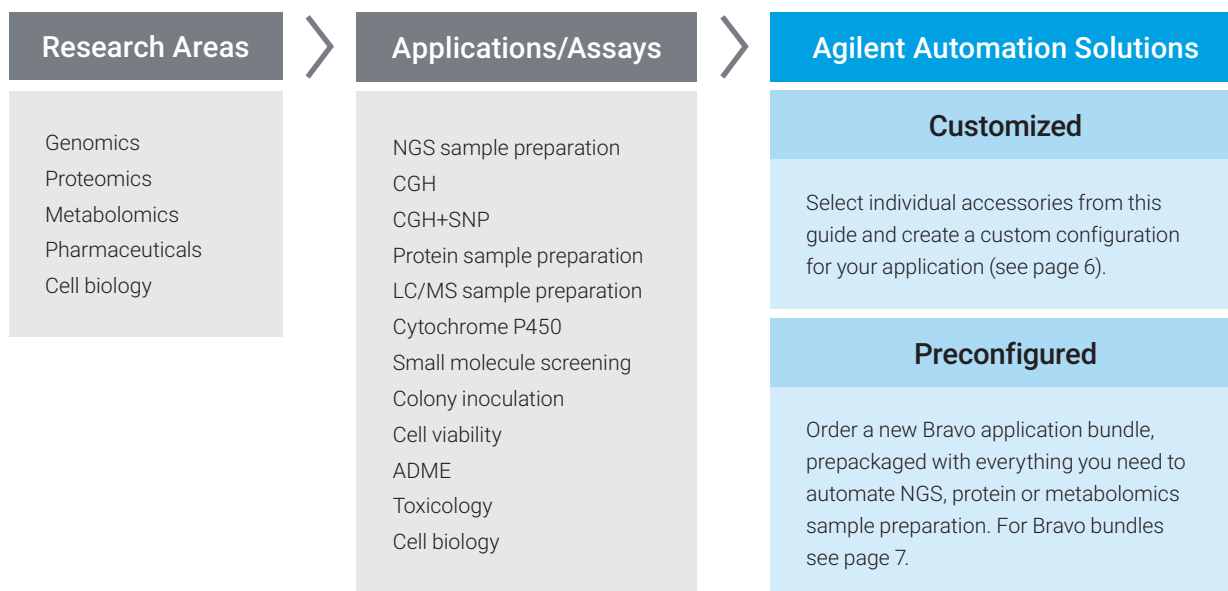
The Agilent Bravo is available in two models: the standard Bravo platform fits most laminar hoods and the Bravo SRT platform is three inches shorter to accommodate smaller hoods. Both versions enable automated liquid handling for cell-based assays or hazardous reagent handling. Their ease-of-use is facilitated by Agilent VWorks Automation Control software, which features an intuitive graphical user interface that makes it easy to create and run protocols, connect and configure accessory modules, and monitor progress.

# Higher Throughput and Greater Reproducibility For Your Laboratory

The Bravo platform offers an expansive line of tools that enable applications across all major life science research areas. The Agilent accessories showcased in this catalog are carefully designed tools used to create customized and turnkey solutions for a wide range of research and discovery applications. This catalog will help you explore the possibilities to make better use of your samples and process them with greater efficiency.

## Customize or choose preconfigured

With Agilent, you can choose a preconfigured hardware/accessory bundle based on a very specific application requirement, such as protein sample preparation with the AssayMAP Bravo package or sample preparation for Next Generation Sequencing (NGS). Alternatively, you can take a manual approach and select the specific accessories that allow you to freely customize the Bravo deck to meet changing assay requirements. Whether you are automating ADME assays or preparing and running cell viability assays, Agilent has the accessories and configurations to fit your workflow.



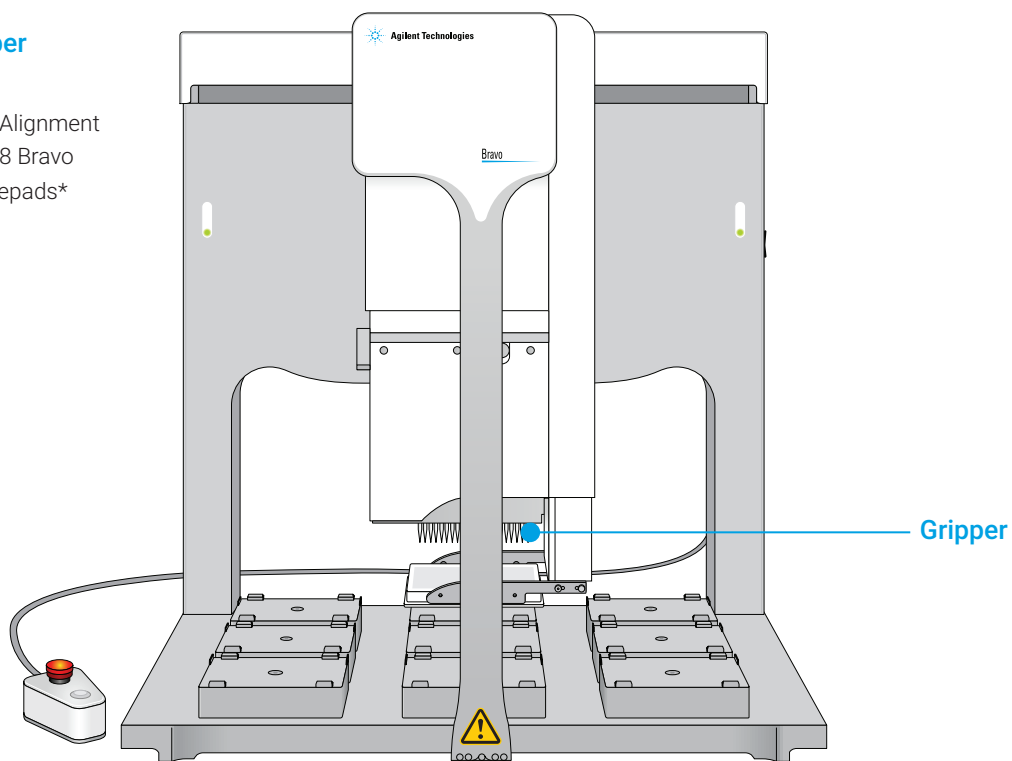
## Tailor the Bravo to your workflow

### Add accessories to the Bravo base platform

Agilent offers a base Bravo platform configuration with a 9-position, open deck that can be customized for your application using the accessories found in this guide.

#### Bravo with gripper G5563AA/GA\*

Includes 1 Passive Alignment  
Deck platepad and 8 Bravo  
Standard Deck platepads\*




\*G5563AA/G5562AA = Bravo automated liquid handling platform bundles. G5563GA/G5562GA = Bravo automated liquid handling platform bundles for Genomics application.

## Choose accessories to customize your Bravo platform

The versatile Bravo platform is easily adapted to a wide range of applications using the accessories in this catalog. Choose on-deck heating, cooling, shaking, and separation, or swap liquid handling heads to meet requirements for changing assays and throughput.

The sections included are shown below:

	Communication, I/O, Integration	8		Reagent Reservoirs And Tip Wash Stations	16
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	Liquid Handling Heads	11		Shaking And Temperature Control	22
	Platepads And Inserts	13		Trash, Disposable Tip	29

## Installation services—applications made easy

Whether you are choosing a new Bravo platform and accessories, or upgrading an existing Bravo platform for a new application, installation services can make the experience simple and straightforward.

Customers with a standalone Bravo platform may choose to install accessories themselves or take advantage of two levels of installation and training support. When a customer buys a Bravo platform, onsite accessory installation is included.

For accessory-only upgrades, most items in this catalog include a labor hours estimate for Agilent onsite field service installations as an option for installation and services, which may be added to the quotation. Estimates for an onsite visit from an applications expert are also available through an Agilent product specialist and Agilent's Professional Services department (as an optional add-on service).

Ready to order? Contact your local product specialist.



### Hardware expert

Field service engineers (FSEs) provide installation and familiarization (hardware installation and simple training basics).

### Applications expert

Field application scientists are available after the accessory has been installed and can provide in-depth training on the Bravo platform, accessories, or software.

## Agilent AC relay

The Agilent AC relay enables you to control power to an accessory located on the Bravo platform using VWorks Automation Control software. It is connected to the power source and the accessory. VWorks software control operates through a serial connection between the controlling computer and the AC relay.

There are currently no Agilent Automation Solutions products that require this item, but it is helpful if you are using a tool or device with your Bravo platform that only requires its power to be turned on or off.

- Requires AC power 100-240 V, 50/60 Hz (8 A Fuse)
- Provides serial connection to host PC running VWorks and allows VWorks control of compatible devices
- Includes AC relay, serial cable DB-9 M to DB-9 F, USB-to-serial adapter, power supply (24 V, 1.1A), USB cable, power supply, and country-appropriate power cord
- Estimated field service engineer (FSE) installation time is 1 hour (not included)

Description	Part No.
AC relay	G5498B/G #502

Ready to order? Contact your local product specialist.



Agilent AC relay

## Agilent risers

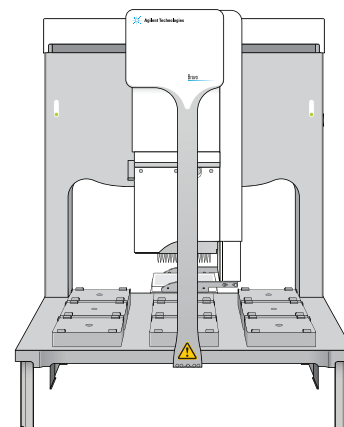
Flexibility is a key benefit of using the Bravo automated liquid handling platform. Agilent risers make it easier to add taller devices that must pass through the deck (locations 4 or 6), such as the Peltier thermal station or the deck position trash. For example, with on-deck trash, disposable tips can fall through the deck for more convenient collection.

Risers are also used for integration, such as when an automated microplate handler, robot, or other adjacent device must be placed at a higher level.

- Includes a set of two, 146 mm risers, and a set of four screws and washers
- Estimated FSE installation time is 1.5 hours (not included)

Description	Part No.
Risers, 146 mm	G5498B/G #055

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Agilent Bravo automated liquid handling platform with risers

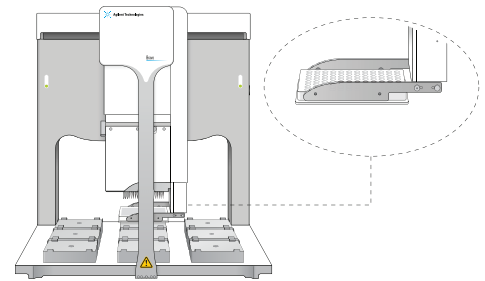
## Agilent gripper upgrade

The Agilent gripper upgrade allows a field service engineer to add a labware gripper to your existing Bravo platform. The gripper is used to pick up and place plates and tip boxes on the platepads of the Bravo deck. It can also move plates and pipette tips between the plate pads, but is not designed for off-deck placements.

- Includes labware gripper accessory, hardware components only
- Estimated FSE installation time is 8 hours (required, not included)

Description	Part No.
Gripper upgrade, non-RoHS Bravo	G5199A
Gripper upgrade, RoHS Bravo	G5597A

Ready to order? Contact your local product specialist.



Agilent Bravo with gripper upgrade

## Agilent light curtain

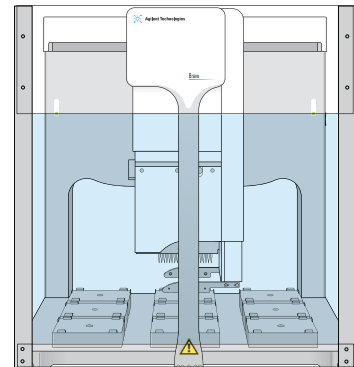
The Bravo platform light curtain arrives with a Bravo platform purchased in compliance with regional safety requirements, or it can be purchased separately and added to an existing Bravo platform.

As part of the safety interlock circuit, the light curtain works in a manner similar to the robot-disable pendant. Two light posts mounted at the front of the Bravo platform project light beams across the front of the device. If an object disrupts the light beams, the safety interlock circuit disables the pipette head motors.

- Includes a junction box for electrical and communication connections (derived from connection to the pendant port of Bravo), clear plastic shields for the front, sides, and rear opening of the Bravo
- The Agilent Accessories Hub can replace the junction box to simplify the deck layout
- Estimated FSE installation time is 2 hours (not included)

Description	Part No.
Light curtain, Bravo	G5498B/G #022
Light curtain, Bravo SRT	G5498B/G #522
Bravo dust cover for std light curtain	G5498B/G #122
Bravo wrap around light curtain (for std Bravo and Bravo SRT)	G5598A

Ready to order? Contact your local product specialist.



Agilent Bravo platform with light curtain

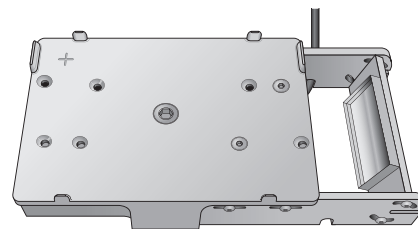
## Agilent mirrored barcode reader

The Agilent mirrored barcode reader reduces errors and saves time tracking samples. It is compatible with machine readable linear (1D) barcode labels and is used to identify samples and match them with relevant information through a database lookup. It replaces a platepad at any deck position and is compatible with VWorks Automation Control software.

- Works with any serial port or the Bravo Accessory Hub
- Compatible symbologies include code 39, code 128, interleaved 2 of 5, code 93
- Barcode height 3.34 mm (0.13 in) or higher
- Required print contrast 25% at 650 nm
- Includes mirrored barcode reader
- Estimated FSE installation time is 1.5 hours (not included)

Description	Part No.
Mirrored barcode reader	G5498B/G #031

Ready to order? Contact your local product specialist.



Agilent mirrored barcode reader

Agilent offers an automation friendly microplate labeler that prints and applies 1D or 2D adhesive labels directly to microplates.



## Agilent disposable-tip pipette heads

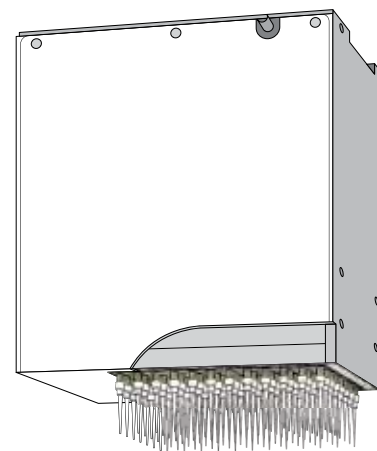
Many of today's laboratory liquid handling applications require the use of disposable tips to prevent carryover/contamination (for example, PCR). The Bravo platform uses interchangeable disposable-tip liquid handling heads that, when combined, cover a very wide volume range (300 nL to 250  $\mu$ L).

Agilent pipette heads are designed to be easily mounted or exchanged and to offer the advantage of being more forgiving than metal-tipped, fixed-tip heads during collisions, increasing uptime during the life of your instrument.

### Single-well, column, row, array, and full plate liquid handling

The Bravo platform provides liquid handling automation for microplates, including low volume single-well, column, row, array, and full plate liquid handling.

Disposable-tip pipette heads can aspirate or dispense into one sample well or an array of sample wells (which include a corner and are contiguous). This is primarily used for single-tip cherry picking and occasionally for multiple-tip or array cherry picking. This feature is available in Agilent's VWorks Automation Control software, within the Bravo platform's liquid handling tasks (Set Head Mode). The Set Head Mode allows use of all tip barrels, full columns, full rows, or partial rows and columns.



Agilent disposable-tip pipette head

### Liquid handling performance\*

Together, Agilent disposable-tip pipette heads and tips cover a pipetting volume range from 300 nL to 250  $\mu$ L with 5% CV. High precision is achieved by optimizing each head for a specific portion of the pipetting volume range. Typical %CVs for dispensing 2  $\mu$ L are 2.1% using DMSO. Agilent pipette heads are designed to be compatible with most common life science laboratory reagents and, with optimization, CVs better than 5% can be achieved across many liquid types.

Agilent disposable-tip heads are designed to work in two liquid volume ranges: small transfer (ST) and large transfer (LT).

*\*Agilent Bravo platform performance data is based on the use of Agilent-certified thin-walled, low-retention tips and optimized liquid classes.*

Description	Maximum Volume	Compatible Well Formats	Part No.
384ST 384-Well disposable-tip pipette head	70 $\mu$ L	96-, 384-, or 1536-well	G5056A/G
96ST 96-Well disposable-tip pipette head	250 $\mu$ L	96- or 384-well	G5057A/G
96LT 96-Well disposable-tip pipette head	70 $\mu$ L	384- or 1536-well	G5055A/G

Ready to order? Contact your local product specialist.

## Liquid Handling Heads

### Agilent AssayMAP microchromatography head and accessories

The Agilent Bravo platform for AssayMAP technology provides open access, walkaway automation for complex sample preparation workflows. The platform is equipped with a Bravo 96AM head containing 96 ultra-low dead-volume syringes, which are capable of highly precise positive-displacement flow control in either direction. The Bravo 96AM head is designed to be easily installed and removed by a user.

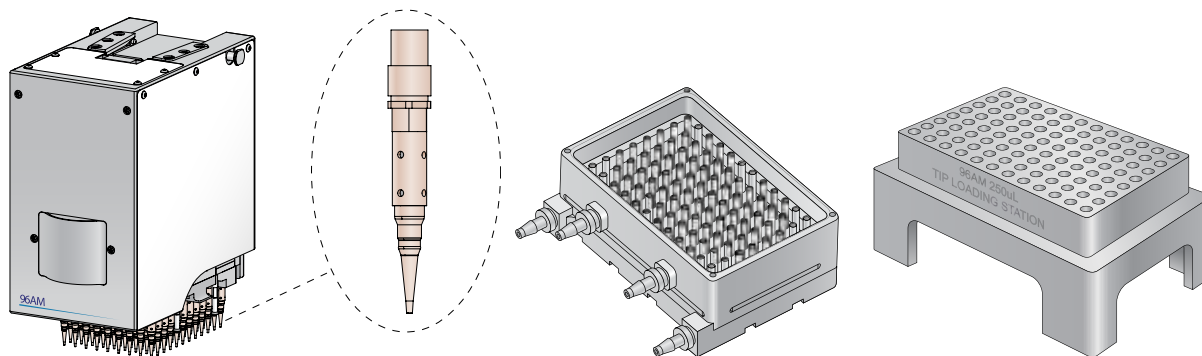
When paired with AssayMAP cartridges, the platform delivers a high-throughput, high-precision solution for affinity purification and quantitation of antibodies, post-translational modifications, and biomarker research and development.

Adding AssayMAP capability to an existing Bravo platform requires the components listed below, as well as AssayMAP cartridges. Different AssayMAP cartridge workflows may require alternate accessory configurations.

Description	Part No.
AssayMAP head	G5058A
96AM tip wash station	G5498B/G #057
Pump module 2.0	G5498B/G #058
96AM cartridge and tip seating station*	G5409-20025

\* Mounting 250  $\mu$ L LT tips requires the 96AM cartridge and tip seating station (special tip holder) instead of a 250  $\mu$ L tip box.

Ready to order? Contact your local product specialist.



Agilent Bravo 96AM head, wash station, and cartridge and tip seating station

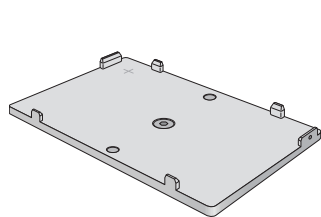
## Agilent platepads

The deck of the Bravo has been designed to be compatible with a wide range of labware, tip boxes, and devices through the use of standard and specialized platepads and inserts. Most platepad hardware can be easily relocated by an end-user, but there may be software or protocol constraints that govern when and where certain platepad types may be used.

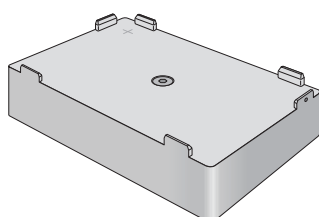
- May be located in any deck position
- Estimated FSE installation time is 0.5 hours (not included)

Description	Part No.
Deck platepad, short (standard Bravo SRT)	G5498B/G #005
Deck platepad (standard Bravo)	G5498B/G #004
Bravo platepad, closed corners	G5498B/G #125
Portrait platepad for Bravo	G5498B/G #014

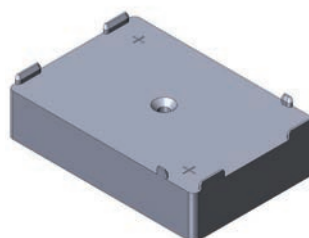
Ready to order? Contact your local product specialist.



Agilent deck platepad, short



Agilent deck platepad



Agilent portrait platepad for Bravo



Agilent Bravo platepad, closed corners

## Glossary of terms

**Platepad**—holds microplate on deck

**Alignment station**—platepad designed to align microplates and tip boxes

**Tip box platepad**—holds tip boxes on deck

**Insert**—sits within platepad to hold compatible devices in place (for example, teach plate or thermal plate insert)

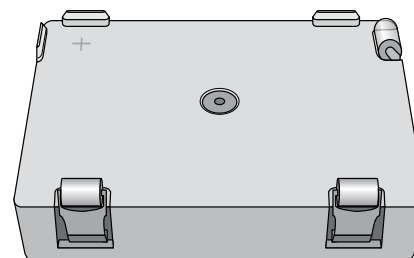
## Agilent alignment station

The Agilent alignment station improves the alignment and positioning of microplates and tip boxes. It is recommended for 384-tip boxes and can be located in any deck position.

- Included in some Bravo platform configurations
- Estimated FSE installation time is 0.5 hours (not included)

Description	Part No.
Alignment station (passive, 3-springed rollers 384/1536 plates, ST tip boxes)	G5498B/G #028

Ready to order? Contact your local product specialist.



Agilent alignment station

# Platepads and Inserts

## Agilent tip box platepads

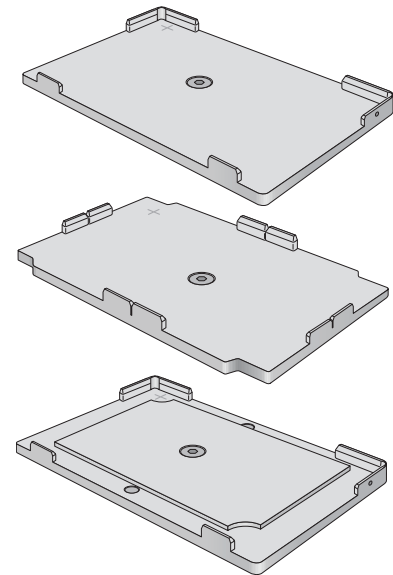
Agilent disposable tip box platepads provide extra support and improve the alignment of disposable tip boxes. They may be located in any deck position and are also known as tip loading stations.

- Estimated FSE installation time is 0.5 hours (not included)

Description	Part No.
ST tip loading station (Bravo SRT)	G5498/G #029
LT tip rack insert, for legacy 200 µL tips (Bravo SRT)	G5498/G #007
SRT platepad for 250 µL LT tip boxes	G5498/G #020

*Note: The Agilent Bravo platform works in two liquid volume ranges: small transfer (ST) and large transfer (LT).*

Ready to order? Contact your local product specialist.



Agilent deck platepads: ST tip loading station, SRT platepad, and LT tip rack insert

## Agilent inserts

Agilent inserts are typically passive, machined metal blocks that sit on a platepad on the Bravo deck. They can be used in various configurations with other Agilent accessories for the Bravo platform.

There are three kinds of inserts available:

- **Nested rack**—supports nested disposable tips, to save deck space
- **Teach plate**—marked with a cross, for teaching individuals how to use the Bravo where labware is located on deck
- **Thermal plate**—improves heat transfer to microplates on a standard or Peltier thermal station

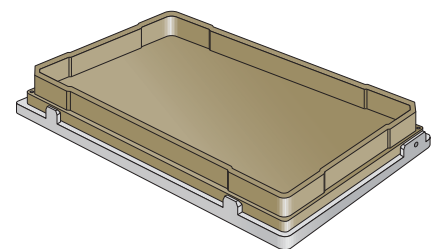
### Nested rack insert

The Agilent nested rack insert is required for use with nested tips when they are used with small transfer (ST) heads. They can be located in any deck position on a regular Agilent platepad, but not on a tip box platepad.

- Estimated FSE installation time is 0.5 hours (not included)

Description	Part No.
Nested rack insert	G5498/G #003

Ready to order? Contact your local product specialist.



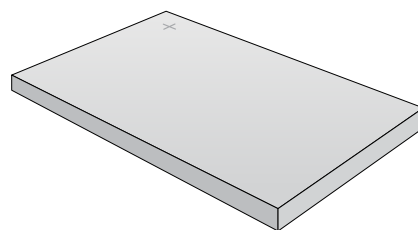
Agilent nested rack insert on a Bravo SRT platepad

## Teach plate insert

The Agilent Teach Plate Insert is marked with a cross and is used to adjust the teachpoint for an accessory, such as the orbital shaking station, after it has been installed on the Bravo deck. It is included with all new Bravo platforms and can be placed in any deck position.

Description	Part No.
Teach plate, HW1	G5550-17692

Ready to order? Contact your local product specialist.



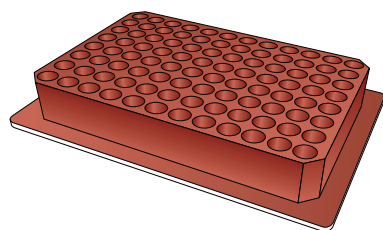
Agilent teach plate insert

## Thermal plate insert

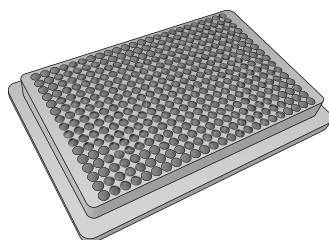
Agilent thermal plate inserts improve heat transfer to microplates when they are placed on a standard thermal or Peltier thermal station.

Description	Part No.
PCR plate insert	G5498B/G #013
Insert 384 Eppendorf twin.tec PCR	G5498B/G #060
Deep-well plate insert	G5498B/G #012
Thermal insert, U-bottom	G5498B/G #126
Thermal insert, deep-well	G5498B/G #127
Bravo labware riser, 28.4 mm	G5498B/G #061

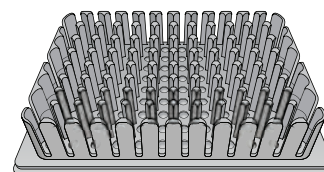
Ready to order? Contact your local product specialist.



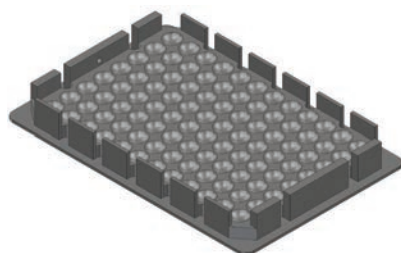
Agilent PCR plate insert



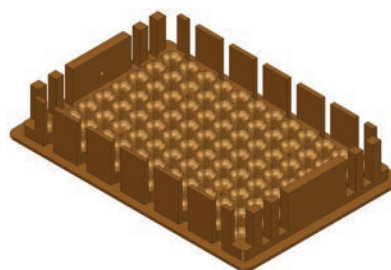
Agilent insert 384 Eppendorf twin.tec PCR



Agilent deep-well plate insert



Agilent thermal insert, U-bottom



Agilent thermal insert, deep-well

## Agilent reagent reservoirs and tip wash stations

Agilent offers three different types of reagent reservoirs:

- Open reservoirs
- Reservoirs with overflow troughs
- Reservoirs with arrays of individual tip chimneys (96 or 384)

Agilent reagent reservoirs are approved for use with many reagents and solvents commonly used in life science applications. If you have questions on the use of a particular chemical or solvent in an Agilent reservoir, contact Automation Solutions Technical Support before use.

### Agilent autofilling reservoir—good efficiency

The Agilent autofilling reservoir is an open reservoir that can supply reagents to 96- and 384-channel pipette heads while providing **good efficiency** in washing tips and conserving precious wash fluid. The autofilling accessory is compatible with an optional weigh station and may be located in any deck position.

Although open reservoirs are typically used to hold reagents and reservoirs with chimneys are used to wash tips, both can be used for either application depending on the wash fluid or reagent and its sensitivity to air or light.

Agilent autofilling accessories can be automatically filled or drained with VWorks using the peristaltic pump module (purchased separately).

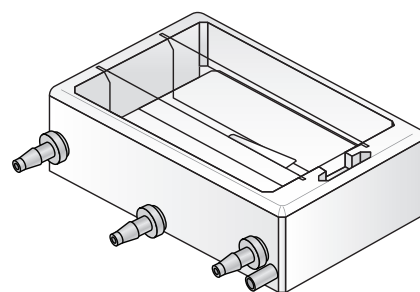
- Estimated FSE installation time is 1 hour (not included)

Description	Part No.
Autofilling reservoir	G5498B/G #053

Ready to order? Contact your local product specialist.

### Integration tips

- Requires pump module
- Pump is VWorks controlled
- Ideal deck locations: 1, 2, and 3
- Compatible with all Bravo and Bravo SRT models



Agilent autofilling reservoir

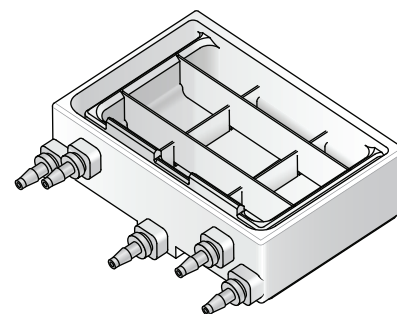
## Agilent open bath tray<sup>1</sup>—Better efficiency

This is an open tray that can supply reagents to 96- and 384-channel pipette heads. It has an overflow trough to reduce the mixing of fresh and spent fluids. It provides **better efficiency** for washing tips and conserving precious wash fluid. It is an autofilling accessory that is compatible with the optional Agilent weigh station and may be located in any deck position.

- Estimated FSE installation time is 1 hour (not included)

Description	Part No.
Open bath tray	G5498B/G #048

Ready to order? Contact your local product specialist.



Agilent open bath tray

## Tip wash stations<sup>2</sup>—Best efficiency

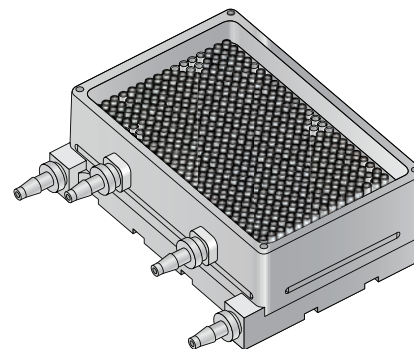
This reservoir has individual tip chimneys and an overflow trough to reduce the mixing of fresh and spent fluids. It demonstrates the **best efficiency** in washing tips and conserving precious wash fluid. It is an autofilling accessory that is compatible with the optional Agilent weigh station and may be located in any deck position.

- Estimated FSE installation time is 1 hour (not included)

Description	Pipette Head Compatibility	Part No.
384-chimney	384-well	G5498B/G #052
96-chimney	96-well or 384-well	G5498B/G #051
AssayMAP (96)	AssayMAP Bravo	G5498B/G #057
96-channel wash station		G5498B/G #090

<sup>1</sup>Formerly the open wash reservoir and open wash station.  
<sup>2</sup>Also known as the MicroWash reservoir.

Ready to order? Contact your local product specialist.



Agilent 384-chimney tip wash station

# Reagent Reservoirs and Tip Wash Stations

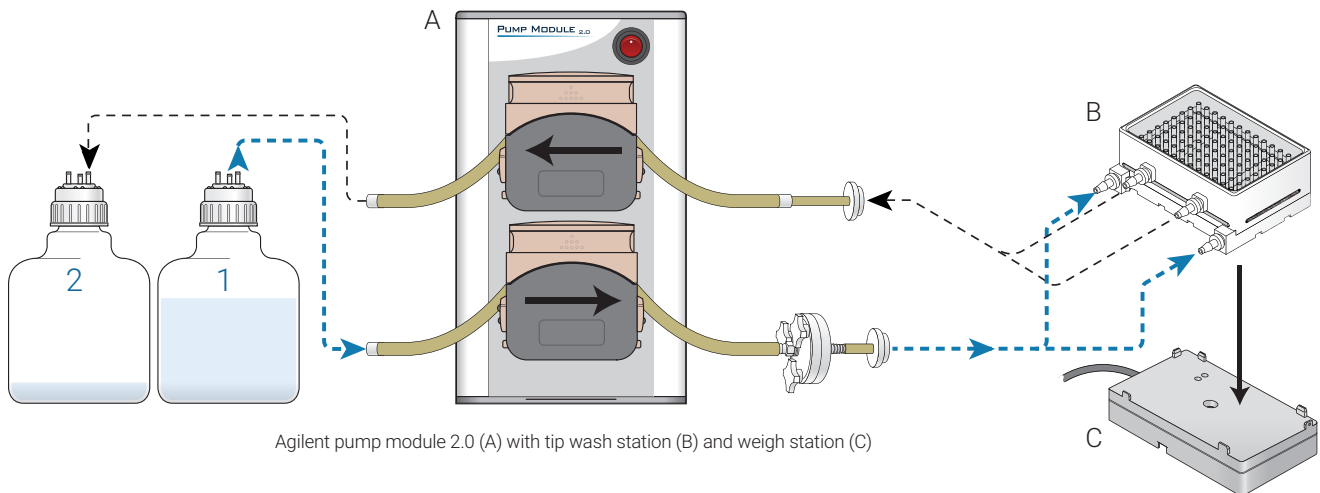
## Agilent peristaltic pump module 2.0

The Agilent peristaltic pump module 2.0 can be used with autofilling accessories to automatically fill reagent reservoirs. It works with the optional Agilent weigh station, which, when properly configured in Bravo Diagnostics, can be used to ensure that the reservoir or tray is filled to a constant liquid level during the pump reagent task in a protocol. By monitoring the weight of the reservoir that sits on it, the weigh station controls when the pump module is activated. One pump module is used for each pairing of reservoir and weigh station. The weigh station replaces a standard Bravo platepad.

- Uses a dedicated RJ45 serial connector on the Bravo
- Operates under full VWorks Software Control
- Estimated FSE installation time:
  - Pump module: 1.5 hours (not included)
  - Weigh station: 2.0 hours (not included)

Description	Part No.
Pump module 2.0	G5498B/G #058
Pump tubing kit	G5498B/G #001
Weigh station	G5498B/G #030

Ready to order? Contact your local product specialist.





## Manual fill reservoirs

The Agilent manual fill reservoir is an open tray, made of polypropylene, which can be installed on a platepad in any position to supply reagents to 96- and 384-channel pipette heads.

It has been optimized for use with 96-well and 384-channel pipette heads and has grooved slots to minimize dead volume, capture and collect precious reagents, and minimize waste. You must manually refill and empty the reservoir.

Automation solutions reservoirs are approved for use with many reagents and solvents commonly used in life science applications. If you have questions on the use of a particular chemical or solvent in an automation solutions reservoir, contact Automation Solutions Technical Support before use.

- Both manual fill reservoirs hold a maximum volume of approximately 150 mL (actual maximum volume varies by application)
- Both manual fill reservoirs have been designed to minimize dead volume (liquid that cannot be aspirated); actual dead volume varies by application and is affected by tip size, diameter, and other characteristics
- Estimated FSE installation time is 1 hour (not included)

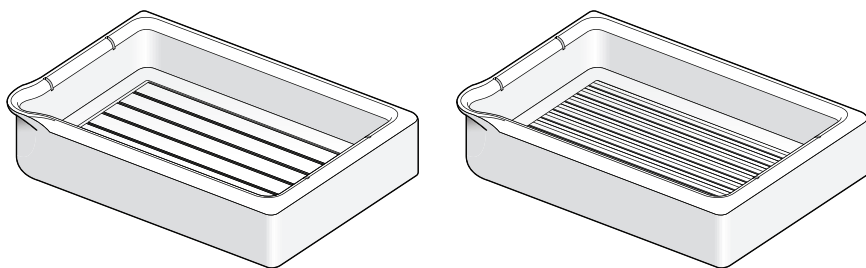
Description	Part No.
Manual fill reservoir (96-well)	G5498B/G #049
Manual fill reservoir (384-well)	G5498B/G #050

Ready to order? Contact your local product specialist.

## Reservoir chemical properties

- Made of polypropylene
- Autoclaving and sterilization is not recommended, as warping may occur
- Offers good chemical resistance to water, DMSO, and many acids and bases at low concentrations
- Suitable for use with certain acids, bases, and solvents at room temperature (for example, acetic acid, and ethyl and methyl alcohol)
- Not recommended for use with concentrated acids or some bases at elevated temperatures

Contact Automation Solutions Technical Support for more information.



Agilent manual fill reservoirs (96-well and 384-well)

## Agilent vacuum filtration station

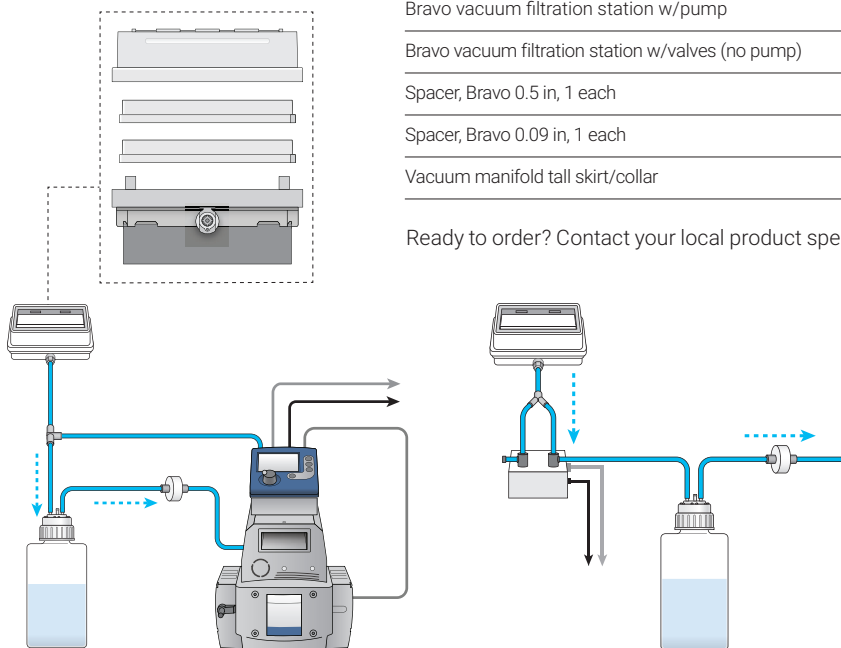
Agilent provides an array of components to make separations simple, quick, and productive. These components are assembled and tested to work with the Bravo liquid handling platform and VWorks software.

The Agilent vacuum filtration station features a microplate-sized manifold footprint that can be used in locations 1, 2, or 3. It works along with an optional, small, quiet vacuum pump under direct VWorks control. It is compatible with both filter-to-waste and filtrate collection applications. Separations can be performed manually or in the fully automated mode using the Bravo gripper to stack and unstack the Vacuum filtration station components. This device is also known as the custom Agilent/Millipore MultiScreen HTS vacuum manifold package.

- Requires a vacuum source (not included)
- Two manifold kits are available to choose from, depending on vacuum source: Agilent vacuum pump or house vacuum/third-party vacuum pump
- Optional Agilent vacuum pump is quiet and is compatible with VWorks software (11.2 or greater)
- Includes a 1 to 2 L vacuum trap bottle, a 1 to 2 L filter-to-waste bottle, 1 vacuum manifold kit, 1 teach plate, filters to protect the pump (10/pk), a short deck platepad, Tygon tubing, miscellaneous fittings, connectors, and fasteners
- Estimated FSE installation time is 1.5 hours (not included)

### Integration tips

- Requires vacuum source
- Agilent vacuum pump module is VWorks-controlled
- Ideal deck locations: 1, 2, or 3
- Requires Bravo gripper for automated assembly and disassembly
- Compatible with all Bravo and Bravo SRT models



Description	Part No.
Bravo vacuum filtration station w/pump	G5432B/G
Bravo vacuum filtration station w/valves (no pump)	G5432B/G #001
Spacer, Bravo 0.5 in, 1 each	G5498B/G #062
Spacer, Bravo 0.09 in, 1 each	G5498B/G #063
Vacuum manifold tall skirt/collar	G5498B/G #069

Ready to order? Contact your local product specialist.

Agilent vacuum filtration station without valves (vacuum pump sold separately) and Agilent vacuum filtration station with valves

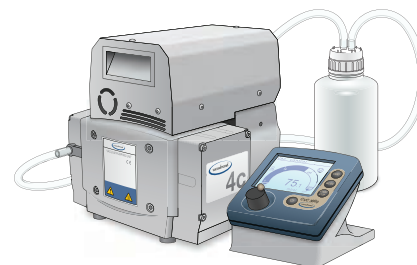
## Agilent vacuum pump

The Agilent vacuum pump offers quiet, efficient operation in a small footprint under direct VWorks control. It is also known as the custom Agilent/Vacuubrand vacuum pump ME 4C NT VARIO.

- Compatible with VWorks software (11.2 or greater)
- Features built-in vent valve and pressure transducer (gauge)
- Includes 0.91 m (3 ft) communication cable DB9F null modem, ME 4C NT VARIO vacuum pump, CVC 3000 controller with LCD panel, Pump Instruction Guide
- Estimated FSE installation time is 1 hour (not included)

Description	Part No.
Vacuum pump	G5498B/G #027

Ready to order? Contact your local product specialist.



Agilent vacuum pump and controller

## Agilent magnetic bead accessory

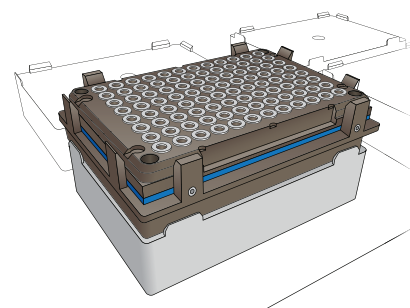
The Agilent magnetic bead accessory fits on a standard Bravo deck platepad and is designed to separate smaller volumes (up to 350  $\mu$ L). It can be located in any deck position and is featured in all Agilent Bravo NGS workstation packages. It is also known as the custom ALPAQUA 96S Super Magnet Plate package.

The Agilent magnetic bead accessory is compatible with a range of common labware in standard and deep-well formats.

- Standard height options include many 96-well U-bottom and V-Bottom plates: Costar 3795 series, most PCR plates (full, semi, or nonskirted); Axygen P-96-450R-C 450  $\mu$ L shallow plate with larger diameter wells, Axygen P-1 mL-SQ-C half deep-well plate.
- Deep-well options include Abgene AB\_1127 half deep-well, AB\_0661, and Ritter Riplate (2 mL)
- The Agilent magnetic bead accessory is incompatible with Eppendorf TwinTec 96-Well PCR plate (with rigid frame)
- Estimated FSE installation time is 1 hour (not included)

Description	Part No.
Magnetic bead accessory	G5498B/G #008

Ready to order? Contact your local product specialist.



Agilent magnetic bead accessory

# Shaking and Temperature Control

## Agilent controllers for heating, cooling, and shaking devices

Many of the products featured in this section are customized INHECO devices that are controlled by INHECO TEC control units (temperature/rpm control).

TEC controllers are available in two versions: Single Tec Control (STC), which controls a single compatible device; and Multi Tec Control (MTC), which controls up to six compatible devices. TEC controllers are purchased separately for most devices, except where indicated.

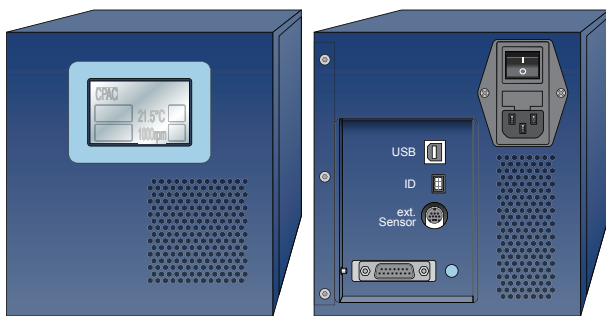
- USB communication with host PC running VWorks Automation Control software
- Accuracy  $\pm 0.5\text{ }^{\circ}\text{C}$
- Universal input 100 to 240 V AC, 50/60 Hz
- Output: STC 1 x 24V DC, 4.5 A; MTC 6 x 24 V DC, 4.5 A
- Dimensions (l x w x h); weight
- STC: 224 x 177 x 146.5 mm (8.82 x 6.97 x 5.77 in); 3.3 kg (8.9 lb)
- MTC: 255 x 248 x 185 mm (10.0 x 9.73 x 7.28 in); 5.5 kg (14.8 lb)
- Includes STC or MTC unit, USB memory stick with manuals, USB cable, and country-appropriate power cord
- Estimated FSE installation time is 2 hours (not included)

### Integration tips

- USB communication
- VWorks Software Control
- See individual device specifications for temperature range
- Compatible with all Bravo and Bravo SRT models

Description	Part No.
STC controller (one device)	G5498B/G #016
MTC controller (six devices)	G5498B/G #015

Ready to order? Contact your local product specialist.



INHECO STC controller



INHECO MTC controller

## Agilent orbital shaking station

The Agilent orbital shaking station is designed to agitate liquid within tissue culture plates or microplates in typical life sciences applications. It is a magnetic shaker with its own wired, combination remote control and power supply. The compact orbital shaking station replaces a standard deck pad, when placed on the adapter pad (included), and may be located in any deck position.

The orbital shaking station automatically returns to its original start position to ensure safe, continuous, unattended operation. The automatic startup function ensures a gradual start to the shaking process to reduce sample splashing. The inductive drive is wear-free and maintenance-free. It is also known as the custom INHECO Teleshake and includes the control unit as shown.

- Compatible with VWorks Automation software
- Use with any serial port or the Agilent Accessory Hub
- Input Voltage 115V 50/60 Hz or 230V 50/60 Hz
- Rotation speed range: 100-2,000 rpm; amplitude: 2.2 mm
- Dimensions (l x w x h); weight
- Orbital shaking station  
146 x 103 x 39 mm (5.75 x 4.06 x 1.54 in); 2000 g (4.41 lb)
- Control unit  
65 x 100 x 85 mm (2.56 x 3.94 x 3.35 in); 500 g (1.10 lb)
- Includes orbital shaking station, control unit, teach plate, USB-to-serial adapter, orbital shaking station integration plate for mounting directly to deck, module connecting cable, and serial RS-232 connecting cable to PC
- Installation by a FSE is optional

Description	Part No.
Orbital shaking station includes control unit	G5431B/H
Orbital shaking station, high speed, includes control unit	G5431B/H #001

Ready to order? Contact your local product specialist.

### Usage tips

- Rectangular sample wells provide better mixing performance than cylindrical or conical wells
- 384- and 1536-well plates with conical wells are less suitable for very high shaking frequencies
- Maximum shaking frequency of 2,000 rpm may not be attainable with filled plates weighing >200 g
- Maximum shaker load is 500 g



Agilent orbital shaking station with control unit and mounting plate

# Shaking and Temperature Control

## Agilent heating shaking station

Many of the products featured in this section are customized INHECO devices that are controlled by INHECO TEC control units (temperature/rpm control). The controllers can be bought separately for most devices except where indicated.

The Agilent heating shaking station replaces an existing platepad and can be located in any deck position. This combination heating and shaking station requires the use of an INHECO STC or MTC controller. It is also known as the custom INHECO Teleshake 95.

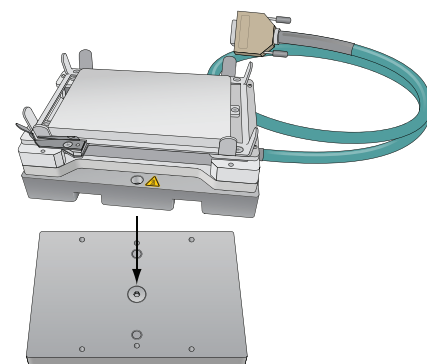
- VWorks automation software compatible
- 24V DC power is provided through the required INHECO controller, which has a universal power supply and can be bought separately (see page 28 for INHECO controllers)
- Heating capacity: 100 Watts
- Temperature range: ambient to + 95 °C
- Maximum frequency: 2,000 rpm (varies with load); amplitude: 2 mm
- Dimensions (l x w x h); weight
- 146 x 103 x 55 mm (5.75 x 4.06 x 2.17 in); 2.6 kg (5.73 lb)
- Communication card for controller not included and also required
- Includes heating shaking station, USB-to-serial adapter, teach plate, and orbital shaking station integration plate for mounting directly to deck
- Estimated FSE installation time is 2 hours (not included)

Description	Part No.
Heating shaking station	G5498B/G #009
Communication card required for controller (slot/shaker card)	G5498B/G #019

Ready to order? Contact your local product specialist.

### Integration tips

- Requires INHECO STC/MTC controller and communication card
- Controller allows VWorks Software Control
- Compatible with all Bravo and Bravo SRT models



Agilent heating shaking station and mounting plate

## Agilent heating station

The Agilent heating station is mounted on top of the deck, in any position. It has a footprint slightly larger than a microplate with a low, robot-friendly profile. When used with the required INHECO STC or MTC controller (bought separately), it can keep samples between ambient temperature and approximately 95 °C. (Contact surface may reach ~135 °C.) The heating station can control samples above ambient temperature only. A heating/cooling device is suggested for temperatures below ambient or for samples requiring rapid cooling. Standard and custom aluminum adapter plates can be used to optimize heat transfer to labware and are available directly from INHECO. This item is comparable to the INHECO HeatPAC.

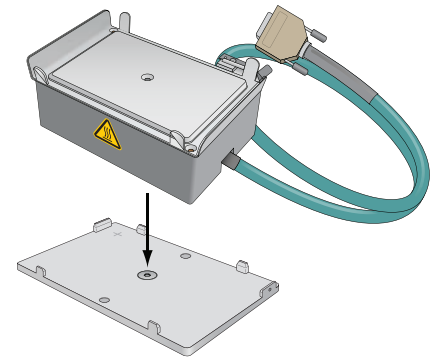
- 24V DC power is provided through the required INHECO controller, which has a universal power supply and can be bought separately (see page 28 for INHECO controllers)
- At 37 °C, target temperature accuracy is  $\pm 0.5$  °C, (uniformity  $\pm 0.5$  °C)
- Convenient, practical channel built into the bottom of the device allows cable to be routed along short or long side of the device
- Dimensions (l x w x h): 128 x 88 x 40 mm (5.04 x 3.47 x 1.58 in)
- Includes heating station with metal plate nest, mounting frame for PCR adapter plate, teach plate, and short deck platepad (standard Bravo SRT) for aligning/positioning/holding device on deck
- Estimated FSE installation time is 2 hours (not included)

Description	Part No.
Heating station	G5498B/G #018
Communication card required for controller (slot/shaker card)	G5498B/G #019

Ready to order? Contact your local product specialist.

## Integration tips

- Requires INHECO STC/MTC controller and communication card
- Controller allows VWorks Automation Control software
- Compatible with all Bravo and Bravo SRT models
- The use of a custom plate nest is recommended (G5498B/G #017)



Agilent heating station and short deck platepad

# Shaking and Temperature Control

## Agilent Peltier thermal station

Able to provide temperature cycling within a range of approximately +4 °C to +100 °C, the compact Peltier thermal station has a footprint slightly larger than a deck platepad and is designed to fit through the deck in positions 4 or 6 only. It requires that the Bravo be used with the optional 146 mm risers (see Page 8).

This device requires the Tec control model STC, which controls a single device, or the model MTC, which controls up to six. Temperatures are approximate and may reflect the temperatures provided by the device manufacturer. This device is also known as the customized INHECO CPAC Ultraflat HT2TEC.

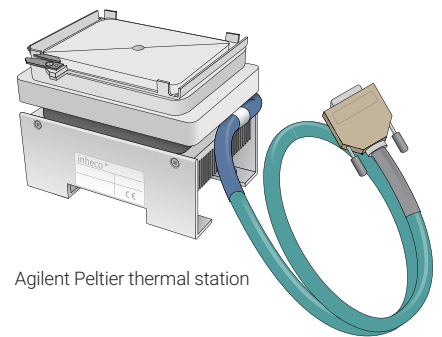
- Requires INHECO controller (bought separately)
- At 37 °C target temperature accuracy  $\pm 0.3$  °C, uniformity  $\pm 0.5$  °C
- 24V DC/4 A power is derived from the STC or MTC controller
- Dimensions (l x w x h) 128 x 88 x 80 mm (5.04 x 3.47 x 3.15 in)
- Includes generic plate nest and adapter for standard microplates
- Both items below include G5498B#019 (communication card for controllers)
- Includes Peltier thermal station, teach plate, deck bracket, cover plate, flat bottom plate, adapter, and slot/shaker card and controller when ordered
- Estimated FSE installation time is 1.5 hours (not included)

Description	Part No.
Peltier thermal station (with STC controller)	G5498B/G #035
Peltier thermal station (without controller)	G5498B/G #021
Risers, 146 mm	G5498B/G #055

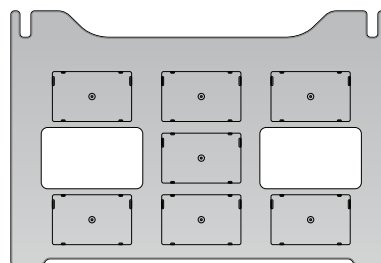
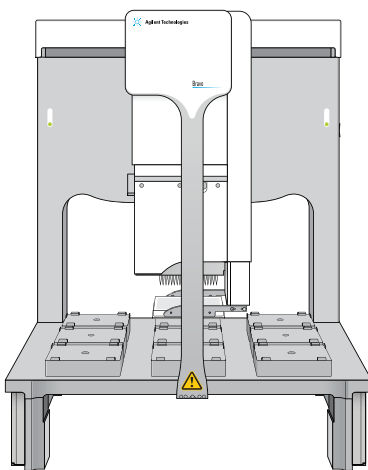
Ready to order? Contact your local product specialist.

## Integration tips

- Requires Bravo on risers or hole in benchtop
- Is a through-the-deck accessory that must be located in position 4 or 6
- Compatible with all Bravo and Bravo SRT models
- The use of a custom plate nest is recommended G5498B/G #017



Agilent Peltier thermal station



Installation requires Bravo platform risers (bought separately) that must be located in positions 4 or 6 on deck



## Agilent plate nest and inserts—for Peltier thermal station

The Peltier thermal station (Page 15) includes a generic plate nest and adapter that are typically used for standard labware microplates (14.4 mm tall).

The Agilent custom plate nest can be used to replace the generic plate nest, to broaden the range of compatible standard or custom plate inserts. Thermal plate inserts are used to improve temperature transfer to microplate samples.

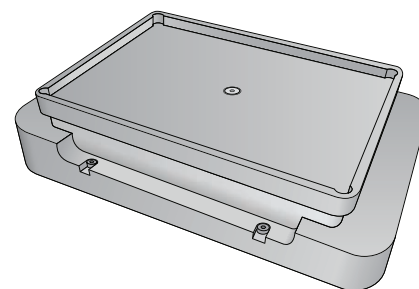
The custom plate nest can accommodate three types of inserts:

- PCR plate insert, which is compatible with most 96-well PCR plates. It is made of red-anodized aluminum, with conical holes. Plates with higher volume sample wells may protrude 4 to 5 mm above the top of the block. This robot-friendly device can also be used to position PCR plates on liquid handler deck.
- Insert 384 Eppendorf TwinTec PCR, which is compatible with Eppendorf TwinTec PCR plates.
- Deep-well plate insert, which is compatible with NUNC, Deep-well 96 HT, 1.3 mL, 26025x,278743/52, U-bottom, square well plates

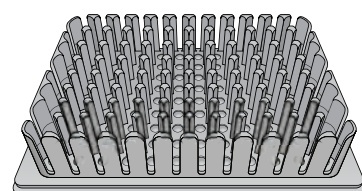
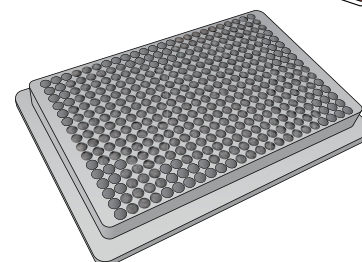
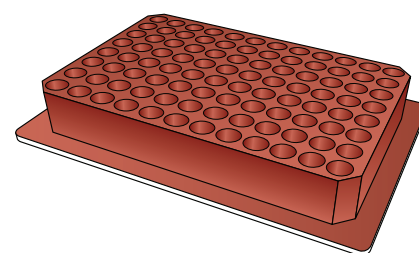
Description	Part No.
Custom plate nest	G5498B/G #017
PCR plate insert	G5498B/G #013
Insert 384 Eppendorf TwinTec PCR	G5498B/G #060
Deep-well plate insert	G5498B/G #012
Thermal insert U-bottom	G5498B/G #126
Thermal insert deep-well	G5498B/G #127

Ready to order? Contact your local product specialist.

The components on this page are most often used in the Agilent NGS Next Gen Sequencing workstations.



Agilent custom plate nest



Agilent PCR plate insert, insert 384 Eppendorf TwinTec, and PCR deep-well plate insert

# Shaking and Temperature Control

## Agilent recirculating heater/chiller—for thermal station

Clean, compact, and quiet (<63 dBA), the Agilent recirculating heater/chiller is a Peltier-based unit that recirculates a temperature controlled liquid. It is used with the Agilent thermal station, which is designed to be heated or cooled by recirculation, providing reliable temperature control of  $\pm 0.1$  °C across an entire microplate. The operating range of the recirculating heater/chiller is -5 °C to +50 °C. However, temperatures are approximate and may reflect the temperatures provided by the manufacturer rather than achievable microplate temperatures.

The recirculating heater/chiller and the thermal station (sold separately) are standalone units that do not communicate with VWorks software. Instead, all temperatures are manually set and fixed. This recirculating heater is also known as the customized solid-state cooling systems ThermoCube 400 watt.

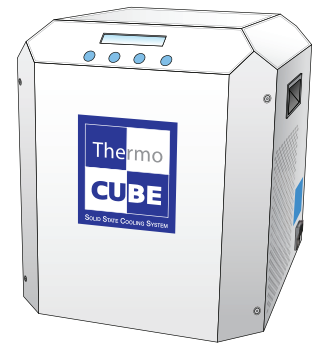
- Works in combination with Bravo thermal station (sold separately)
- Universal input 100 to 240VAC, 5.4 A maximum
- Dimensions (l x w x h) weight  
32.4 x 27.9 x 32.4 cm (12.75 x 11.0 x 12.75 in); 11 kg (23 lb)
- Includes two standard 1.83 meter (6 ft) lines
- Estimated FSE installation time is 1.5 hours (not included)

Description	Part No.
Recirculating heater/chiller	G5498B/G #024

Ready to order? Contact your local product specialist.

### Integration tips

- Recirculating heater/chiller is used to heat and cool thermal station (sold separately)
- Standalone device offers manual temperature control (not VWorks adjustable)
- Compatible with all Bravo and Bravo SRT models



Agilent recirculating heater/chiller

## Agilent thermal station for heating/cooling

The Agilent thermal station is a platepad designed for heating and cooling, and is compatible with the recirculating heater/chiller. Its operating range is from -5 °C to +50 °C, and its temperature control is controlled to  $\pm 0.1$  °C across the microplate when using a recirculating heater/chiller (sold separately).

The Agilent thermal station is available in two configurations, with short-side connectors for deck positions 4–9, and with long-side connectors for positions 1–3. It is also available as a three-plate module for positions 1, 2, and 3.

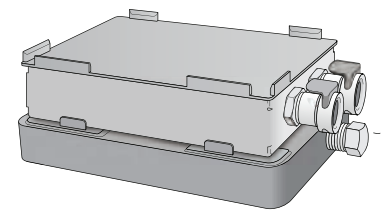
- Estimated FSE installation time is 1.5 hours (not included)

Description	Part No.
Thermal station (short-side connectors)	G5498B/G #036
Thermal station (long-side connectors)	G5498B/G #037
Thermal station (3-plate)	G5498B/G #038

Ready to order? Contact your local product specialist.

### Integration tips

- Plate insert may be required to ensure thermal uniformity across microplates
- Compatible with all Bravo and Bravo SRT models



Agilent thermal station (short-side connectors)

## Agilent deck position trash

The Agilent deck position trash provides a convenient location for the disposal of consumables by replacing a deck platepad at through-deck positions 4 and 6.

The device requires a customer-supplied through-hole in the table supporting the Bravo and a trash collection receptacle.

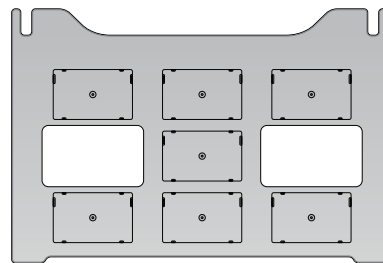
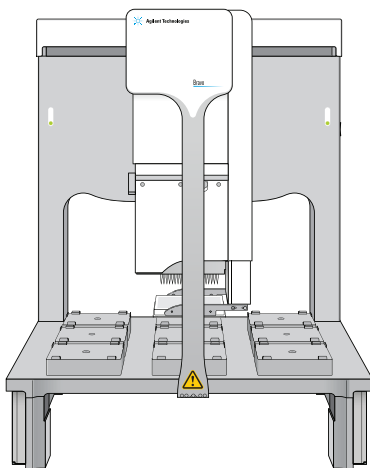
- Estimated FSE installation time of 0.5 hours (not included). Based on standard deck platepad replacement only; does not include collection hardware or its installation.

Description	Part No.
Deck position trash	G5498B/G #056
Risers, 146 mm	G5498B/G #055

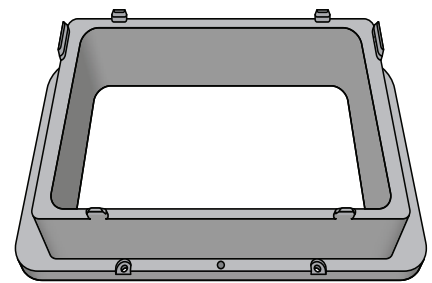
Ready to order? Contact your local product specialist.

### Integration tips

- Requires through-deck mounting and Bravo risers
- Must be located in deck positions 4 or 6
- Compatible with all Bravo and Bravo SRT models



Installation requires Bravo platform risers (bought separately) that must be located in positions 4 or 6 on-deck



Agilent deck position trash

# Quick Accessory Selection Guide and Index

## Accessories for the Bravo automated liquid handling platform



Description	VWorks <sup>1</sup> Control	Available Deck Positions	Temp Range	Third-Party Components <sup>2</sup>	Part No.
<b>Communication, Input/Output, and Integration</b>					
AC relay (powers device on/off)	Yes	NA <sup>3</sup>	NA	NA	G5498B/G #502
Light curtain, standard Bravo (safety)	Yes	NA	NA	NA	G5498B/G #022
Light curtain, Bravo SRT (safety)					G5498B/G #522
Wraparound light curtain, for std Bravo and Bravo SRT (safety)					G5598A
Dust cover, for std Bravo and std light curtain					G5498B/G #122
Risers, 146 mm	No	NA	NA	NA	G5498B/G #055
Bravo labware riser, 28.4 mm					G5498#061
Gripper upgrade, non-RoHS Bravo	Yes	NA	NA	NA	G5199A
Gripper upgrade, RoHS Bravo					G5597A
<b>Identification</b>					
Mirrored barcode reader (requires serial port)	Yes	All	NA	NA	G5498B/G #031
<b>Liquid Handling Heads</b>					
Disposable-tip heads (dispenses fluid into selected wells simultaneously: M x N array, single columns, single rows, or single wells)					
384ST 384-barrel disposable-tip pipette head	Yes	NA	NA	NA	G5056A/G
96ST 96-barrel disposable-tip pipette head	Yes	NA	NA	NA	G5057A/G
96LT 96-barrel disposable-tip pipette head	Yes	NA	NA	NA	G5055A/G
Microchromatography, AssayMAP head (requires G5498B/G #057, G5498B/G #058, and G5409-20025)					
Bravo 96AM head with positive displacement syringes (for AssayMAP cartridges)	Yes	NA	NA	NA	G5058A
<b>Platepads and Inserts</b>					
Platepads for microplates					
Deck platepad (standard on Bravo)	No	All	NA	NA	G5498B/G #004
Deck platepad, short (standard on Bravo SRT)	No	All	NA	NA	G5498B/G #005
Alignment station (passive; 384/1536 plates or ST tip boxes)	No	All	NA	NA	G5498B/G #028
Portrait platepad for Bravo	Yes	All	NA	NA	G5498B/G #014
Bravo platepad closed corners	Yes	All	NA	NA	G5498B/G #125
Platepads for tip boxes					
Deck platepad, 96AM 250 µL tip loading station (AssayMAP Bravo)	No	All	NA	NA	G5409-20025
Alignment station (passive; 384/1536 plates or ST tip boxes)	No	All	NA	NA	G5498B/G #028
Tip loading station (Bravo SRT)	No	All	NA	NA	G5498B/G #029
200 µL tip box (Legacy 200 µL tips Bravo SRT)	No	All	NA	NA	G5498B/G #007
250 µL tip box (Bravo SRT)	No	All	NA	NA	G5498B/G #020
Inserts					
Nested rack insert (required when nested tips are used with ST heads)	No	All	NA	NA	G5498B/G #003
Teach plate, HW1 (included with all new Bravo platforms)	No	All	NA	NA	G5550-17692

<sup>1</sup>Agilent VWorks Automation Control software.

<sup>2</sup>Agilent Bravo platform accessories may contain third-party components that have been customized and optimized for use with the Bravo platform and are supported by Agilent.

<sup>3</sup>NA = Not applicable.

## Accessories for the Bravo automated liquid handling platform

Description	VWorks <sup>1</sup> Control	Available Deck Positions	Temp Range	Third-Party Components <sup>2</sup>	Part No.
 <b>Reagent Reservoirs and Tip Wash Stations</b>					
Autofilling (all use pump module, except where indicated)					
Autofilling reservoir (reagent)	Yes	All	NA	NA	G5498B/G #053
Tip wash station (MicroWash reservoir, 384-chimney)	Yes	1, 2, 3	NA	NA	G5498B/G #052
Tip wash station (MicroWash reservoir, 96-chimney)	Yes	1, 2, 3	NA	NA	G5498B/G #051
96AM tip wash station (Microwash reservoir AssayMAP head)	Yes	1, 2, 3	NA	NA	G5498B/G #057
96-channel wash station					G5498B #090
Open bath tray (formerly open wash reservoir, open wash station)	Yes	All	NA	NA	G5498B/G #048
Peristaltic pumps for autofilling reservoirs					
Pump module 2.0 (required for <i>all</i> autofilling reservoirs and wash stations; required for 96AM tip wash station)	Yes	NA	NA	NA	G549B/G #058
Pump module tubing kit	NA	NA	NA	NA	G549B/G #001
Weigh station (for precise liquid-level control)	Yes	1, 2, 3	NA	NA	G549B/G #030
Manual filling (not recommended for tip washing)					
Manual fill reservoir (reagent, 384-well)	No	All	NA	NA	G549B/G #050
Manual fill reservoir (reagent, 96-well)	No	All	NA	NA	G549B/G #049
 <b>Separation</b>					
Bravo vacuum filtration station w/pump (vacuum manifold options: tall collar, 0.5 in and 0.09 in spacers)	Yes	1, 2, 3	NA	Millipore MultiScreen HTS vacuum manifold and Vacuubrand ME4C NT Vario	G5432B/G
Vacuum filtration station with valves (for use with customer-supplied house or third-party vacuum pump; vacuum manifold options: tall collar, 0.5 in and 0.09 in spacers)	Yes	1, 2, 3	NA	Millipore MultiScreen HTS vacuum manifold	G5432B/G #001
Agilent vacuum pump (ME 4C NT VARIO)	Yes	NA	NA	Vacuubrand ME4C/ME4C NT Vario	G5498B/G #027
Magnetic bead accessory	NA	All	NA	NA	G5498B/G #008

# Quick Accessory Selection Guide and Index

## Accessories for the Bravo automated liquid handling platform

Description	VWorks <sup>1</sup> Control	Available Deck Positions	Temp Range	Third-Party Components <sup>2</sup>	Part No.
<b>Shaking and Temperature Control</b>					
Controllers for heating/cooling/shaking (requires heating/cooling/shaking platepad)					
Controller, heating/cooling/shaking (for 1 device)	Yes	NA	NA	INHECO STC single TEC controller	G5498B/G #016
Controller, heating/cooling/shaking (for up to 6 devices)	Yes	NA	NA	INHECO MTC Multi TECcontroller	G5498B/G #015
Platepad for shaking (with self-contained controller featuring VWorks speed control; does not require G5498B #019)					
Orbital shaking station	Yes	All	NA	INHECO Teleshake 2 mm amplitude	G5431B/H
Orbital shaking station, high speed	Yes	All	NA	INHECO Teleshake 3 mm amplitude (high speed)	G5431B/H #001
Platepad for shaking and heating					
Heating shaking station (requires G5498B #016 or G5498B #015, and G5498B #019)	Yes	All	RT to 125 °C	INHECO Teleshake 95	G5498B/G #009
Platepad for heating					
Heating station (requires G5498B#016 or G5498B #015, and G5498B #019)	Yes	All	RT to 135 °C	INHECO HeatPac	G5498B/G #018
Platepad for heating/cooling (use generic nest for 14.4 mm tall plates and custom nest for specialized plates; requires 146 mm risers)					
Peltier thermal station (includes generic nest, G5498B #016, and G5498B #019)	Yes	4, 6	4 to 110 °C	INHECO CPAC Ultraflat HT2TEC	G5498B/G #035
Peltier thermal station (includes generic nest and G5498B #019; requires G5498B #016 or G5498B #015)	Yes	4, 6	4 to 110 °C	INHECO CPAC Ultraflat HT2TEC	G5498B/G #021
Custom plate nest for thermal station (use with G5498B #12 or G5498B #013)	NA	NA	NA	NA	G5498B/G #017
Insert, deep-well plate (use with G5498B #017)	NA	NA	NA	NA	G5498B/G #012
Insert, PCR plate (use with G5498B #017)	NA	NA	NA	NA	G5498B/G #013
Recirculating heater/chiller					
Chiller, Peltier, 400 watt (required for G5498B #036, G5498B #037, and G5498B #038)	No	NA	5 to 50 °C	Solid-state cooling systems ThermoCube	G5498B/G #024
Platepads for heating/cooling					
Thermal station (recirculator-based; short-side connectors; use with G5498B #024)	No	4, 5, 6, 7, 8, 9	See chiller	NA	G5498B/G #036
Thermal station (recirculator-based; long-side connectors; use with G5498B #024)	No	1, 2, 3	See chiller	NA	G5498B/G #037
Thermal station, 3-position (recirculator-based; use with G5498B #024)	No	1, 4, 7, & 3, 6, 9	See chiller	NA	G5498B/G #038
Thermal insert U-bottom					G5498B/G #126
Thermal insert deep-well					G5498B/G #127
<b>Trash, Disposable Tip</b>					
Deck position trash (requires customer-supplied collector)	No	4, 6	NA	NA	G5498B/G #056

<sup>1</sup>Agilent VWorks Automation Control software.

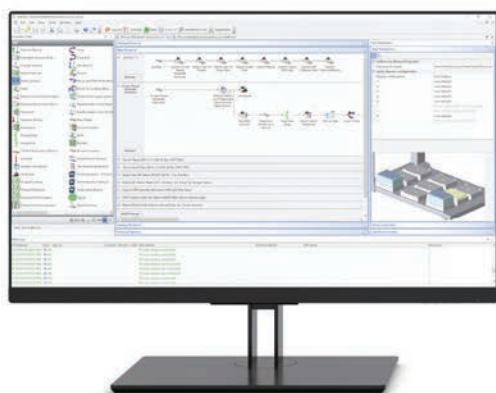
<sup>2</sup>Agilent Bravo platform accessories may contain third-party components that have been customized and optimized for use with the Bravo Platform and are supported by Agilent.

<sup>3</sup>NA = Not applicable.

## Accessories for the Bravo automated liquid handling platform

Description	Part No.
<b>Labware Microplate and Tube Racks for Bravo and BenchCel</b>	
Stacker racks	
Front loading rack, 250 mm	G5498B #064
Front loading rack, 660 mm	G5498B #065
Top loading rack, 660 mm	G5498B #066
Top loading rack, 860 mm	G5498B #067
Tube racks	
SBS rack for platepad, 50 mL	G5498B #563
SBS rack for deck mount, 50 mL	G5498B #564
SBS rack for platepad, 15 mL	G5498B #565
SBS rack for deck mount, 15mL	G5498B #566
SBS rack for platepad, 10 mL	G5498B #567
SBS rack for deck mount, 10 mL	G5498B #568
SBS rack for platepad, 2 mL	G5498B #569
SBS rack for deck mount, 2 mL	G5498B #570
NGS system accessory	
Covaris plate adapter	G5498B #068

Ready to order? Contact your local product specialist.



# Consistent Metabolomics Data Starts with Consistent Sample Preparation

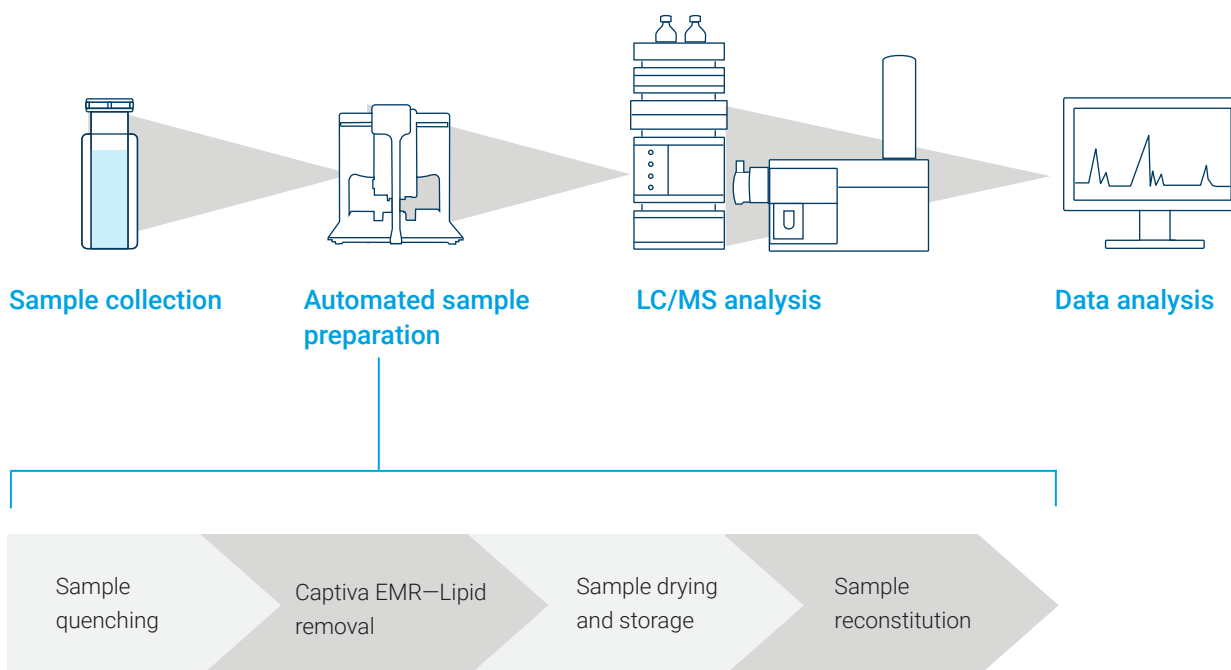
Manual sample preparation is time-consuming and—worse—inherently error prone, which can pose a significant challenge for your metabolomics studies.

## Achieve consistent and reproducible results that are operator independent with the new Agilent Bravo Metabolomics Sample Prep Platform

Based on the Agilent Bravo automated liquid handler, the Bravo Metabolomics Sample Prep Platform is designed for extracting metabolites in plasma samples. This innovative platform provides an alternative to manual sample preparation that lets you:

- Standardize plasma sample preparation leading to downstream LC/MS analysis
- Ensure batch-to-batch consistency
- Process samples with precise pipetting
- Minimize variability between analysts
- Reduce the need for costly rework

### Automate and standardize your metabolomics sample preparation protocol





# Seamlessly Integrate Sample Preparation into Your LC/MS Metabolomics Workflow

Begin your discovery and targeted metabolomics workflow with an automated platform specifically designed for metabolomics sample preparation from plasma.

By increasing consistency, reliability, efficiency, and walk-away time, the Bravo Metabolomics Sample Prep Platform helps you to obtain reliable results, faster. So you can discover meaningful biomarkers with speed and confidence.



**Agilent Bravo Metabolomics  
Sample Prep Platform**

**Agilent Bravo Metabolomics  
Workbench software**

**Agilent 1200 Series  
Infinity II LC system  
for separation**

The Agilent Bravo Metabolomics Sample Prep Platform is a powerful addition to the Agilent metabolomics workflow solution, and can be used with any LC/MS system.

**Agilent triple quad  
or Q-TOF LC/MS  
for measurement**

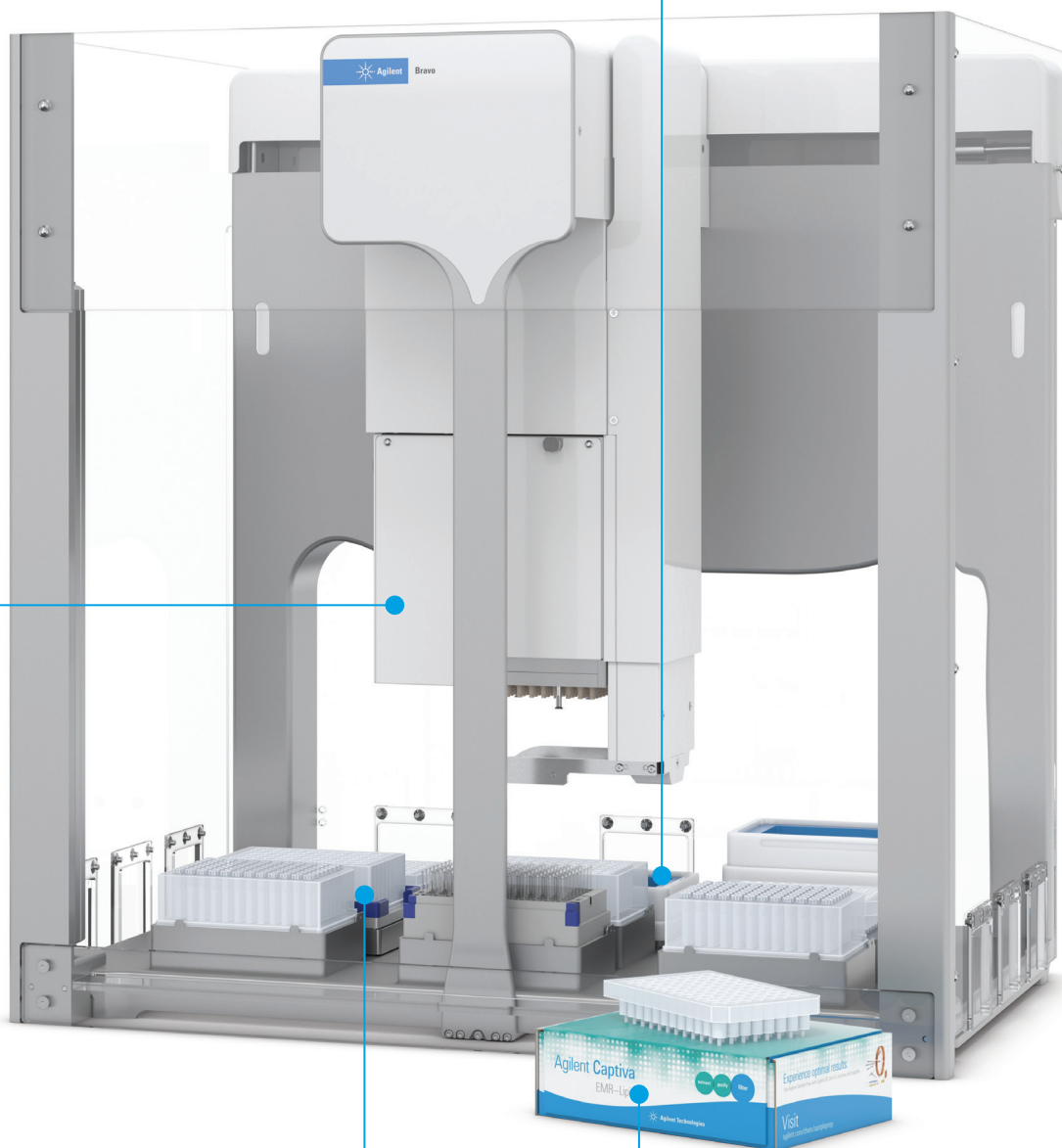
## Agilent Bravo Metabolomics Sample Prep Platform

### 96LT disposable tip head

Provides precise, accurate, and consistent liquid transfers across a wide volume range (2–250  $\mu$ l).

### Vacuum station

Makes automated vacuum filtration applications simple, quick, and highly reproducible.



### Orbital shaking station

Automatically shakes labware for a specified length of time.

### Captiva EMR—Lipid 96-well plates

Provides highly selective and efficient lipid/matrix removal without unwanted analyte loss.

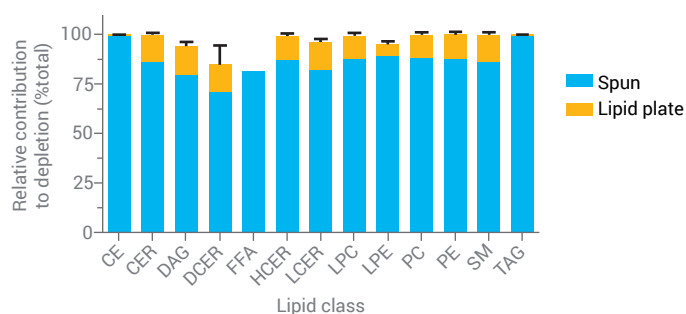
# See the Difference Automation Can Make in Your Metabolomics Analysis



Streamlining your workflow with the Bravo Metabolomics Sample Prep Platform can help you process large amounts of samples—while achieving consistent, quality results.

## Efficient lipid removal

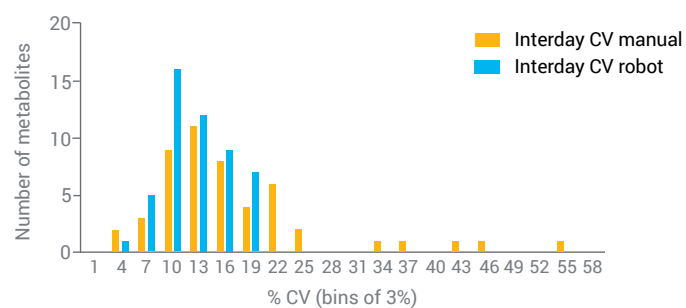
Novel Captiva EMR—Lipid technology removes lipids based on a combination of size exclusion and hydrophobic interaction. Effective lipid removal assures minimal ion suppression of target analytes, which significantly improves method reliability and ruggedness. Captiva lipid depletion and sample cleanup increase metabolite signal intensity.



The Captiva EMR—Lipid plate removes lipids more efficiently than centrifugation alone across major lipid classes.

## Better data reproducibility

Automated sample preparation ensures better consistency across samples, batches, and users. That means lower CVs, less variability, fewer replicates, and more trustworthy results.



A comparison of the top 50 metabolites by lowest CVs from manual extraction and from automated extraction across different days.

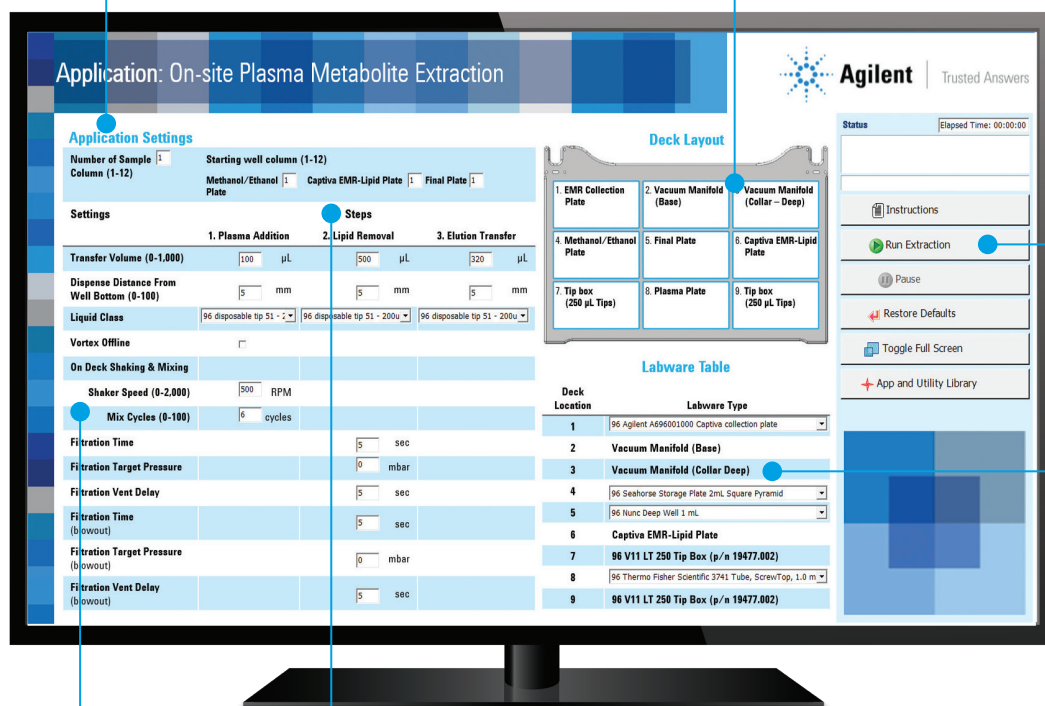
# Dedicated, Intuitive Software Enables Smooth Implementation, Regardless of Skill Level

Agilent Bravo Metabolomics Workbench software puts the power of automation at your fingertips. Using a form-based interface, you can quickly and easily process samples for downstream analysis.

What's more, the Bravo Metabolomics Workbench software requires no complex programming, allowing any user to walk up and start the automated sample preparation. So you can get consistent results easier than ever before.

Easy-to-use software interface reduces training costs—and is designed for plasma sample preparation

Deck layout guides the user to set up the deck correctly



Start your workflow with the click of a button

Select desired labware to complete the tasks in your protocol

Adjustable parameters to optimize your run

Streamlined automation control: Operate multiple automated sample prep steps for maximum throughput

# The most complete and versatile system for automated NGS sample preparation

Agilent offers a complete instrument and reagent solution for automating Next Generation Sequencing (NGS) sample preparation. As a result, you can achieve excellent reliability and reproducibility with easy scale up of your research laboratory throughput using reagents, automation, protocols, and support from a single source.

## Optimized protocols

Our NGS automation solutions include optimized scheduling protocols for liquid handling and labware management using VWorks software to easily automate your NGS sample preparation. Protocols have been fully developed and validated for Agilent's SureSelect/HaloPlex library preparation and target enrichment reagents. Additional automation protocols for select 3rd-party reagent providers are also available.

## Reproducible data

Automated liquid handling for library preparation and target enrichment leads to more consistent yields and higher quality data than manual processing.

## Higher Throughput

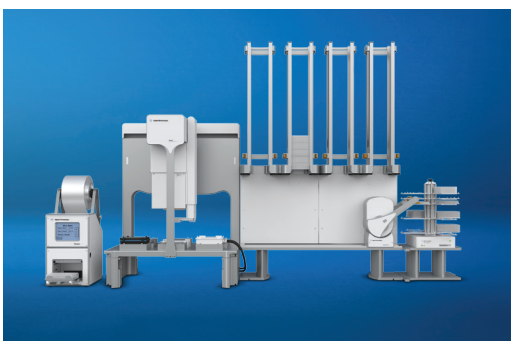
Agilent's comprehensive and flexible automation solutions reduce manual intervention to increase throughput and maximize your walk-way time.

# Simplify your scale up with modular automation solutions



## Agilent Bravo NGS (NGS A, Option A): High throughput and improved reproducibility with a small footprint

- Agilent Bravo Automated Liquid Handling platform
- Agilent 96 Channel Disposable Tip Head
- Agilent Bravo accessories for heating, cooling, shaking, and magnetic separation



## Agilent Bravo NGS (NGS B, Option B): High throughput and improved reproducibility with more walkaway time

- Agilent Bravo NGS
- Agilent BenchCel 4R Microplate Handler
- Agilent Labware MiniHub
- Agilent PlateLoc Thermal Microplate Sealer

## Agilent NGS Workstation delivers higher throughput with less hands-on time

Automating your NGS sample preparation with either Agilent Bravo NGS or NGS Workstation increases laboratory throughput up 3.5 fold compared to manual sample preparation. For whole genome sequencing applications that require only library preparation, 96 samples can be prepared in less than four hours to increase laboratory output to 960 sequencer ready libraries in a single week. For more complex protocols, such as targeted resequencing using Agilent SureSelect<sup>XT</sup>, both systems can complete library preparation and target enrichment for 192 samples in a five-day work week.

	Hands-On Time for complete Manual Prep workflow	Maximum Number of Samples Processed/Day	Hands-On Time for complete Automated Prep workflow	Maximum Number of Samples Processed/Day
Library Prep	375 min	8-24	25 min	96
Pre-Capture PCR	20 min	8-24	15 min	96
Hybridization Preparation	20 min	8-24	5 min	96
Capture	210 min	8-24	20 min	96
Post-Capture PCR	50 min	8-24	10 min	96
Totals	675 min	16-48 per week	75 min	192 per week

**Table 1.** NGS Workstation drives 3.5x throughput with 4x less hands-on time by automating pipetting and sample handling with Agilent SureSelect<sup>XT</sup>. Number of samples/day assumes staggering sample processing by end user over multiple days.

# Reproducible genomics protocols made easy

The Bravo Automated Liquid Handling Platform is the core of Agilent NGS automation solutions



## Highly Capable Liquid Handler

- Compact design with a small footprint is compatible with most laboratory bench tops
- Open system for other genomics applications: PCR/qPCR plate setup, CRISPR library preparation, serial dilutions, and nucleic acid purifications
- Fast and flexible processing of full or partial plates

## Reproducible and Accurate Pipetting Performance

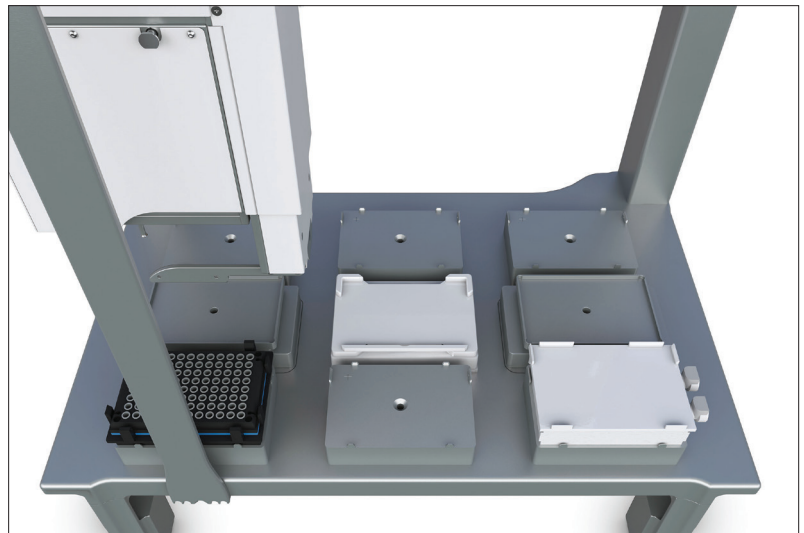
- Dispenses from 2 uL to 180 uL with 5 % CV  $\pm$  10 % accuracy
- Installation Qualification (IQ) and Operation Qualification (OQ) services are available

## Versatile Platform

- Easily swappable head expands your throughput to 384 wells
- Fully customizable with each position configurable for shaking, heating, cooling, and more
- Easy-to-change pipette heads expand dispensing volume from 300 nL to 250  $\mu$ L in 96, 384, and 1536-well formats

## A proven standard for NGS automation

Bravo liquid handlers deliver reliable performance for NGS at over 150 customer sites worldwide, including major genome research centers, biopharmaceutical companies, and academic research laboratories



# Agilent's components increase throughput and protect precious samples



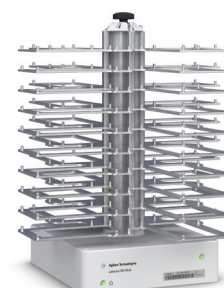
## BenchCel 4R Microplate Handler

The BenchCel 4R Microplate Handler is a reliable, rapid robotic plate handler with high-capacity labware storage. It delivers labware and reagents between the Labware MiniHub and the Bravo platform. The BenchCel gives users substantially more walkaway time for liquid-handling intensive NGS sample preparation methods.



## PlateLoc Thermal Microplate Sealer

The programmable PlateLoc Thermal Microplate Sealer creates a high precision seal that preserves the integrity of low volume samples during heated incubations and even overnight. It is easy to use and flexible, accommodating a wide range of microplates and tube racks.



## Labware MiniHub

The Labware MiniHub is a rotating, randomaccess carousel for presenting and storing labware. Featuring user-configurable spacing to easily hold a mix of microplates, reagent reservoirs, and pipette tips, the Labware MiniHub is compact and flexible.



## Agilent VWorks Automation Control Software

Agilent VWorks is an intuitive scheduling program capable of driving the operation of the Bravo platform and additional devices. The graphical user interface makes it easy for users to run existing protocols, develop new protocols, and monitor progress. Forms are available for SureSelect, HaloPlex and numerous 3rd-party NGS reagents to save time and maximize productivity.

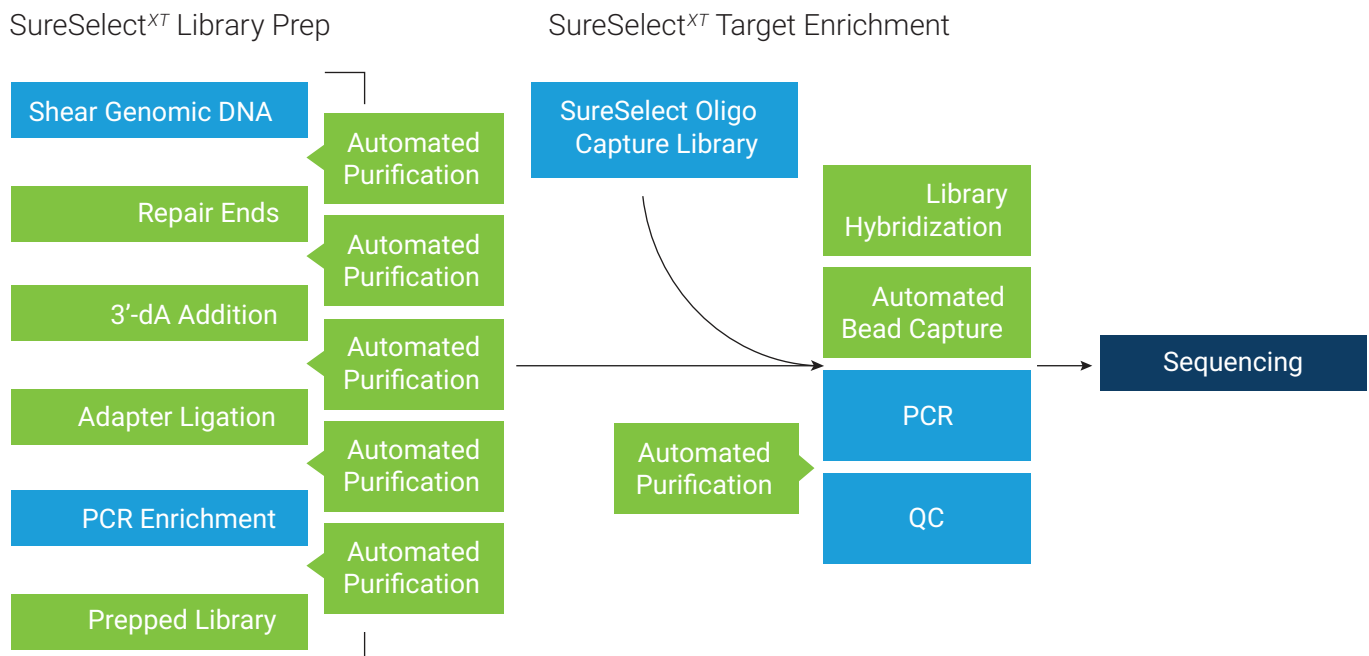


# Proven protocols streamline next generation sequencing sample preparation



## Automated sample preparation for NGS sequencing platforms

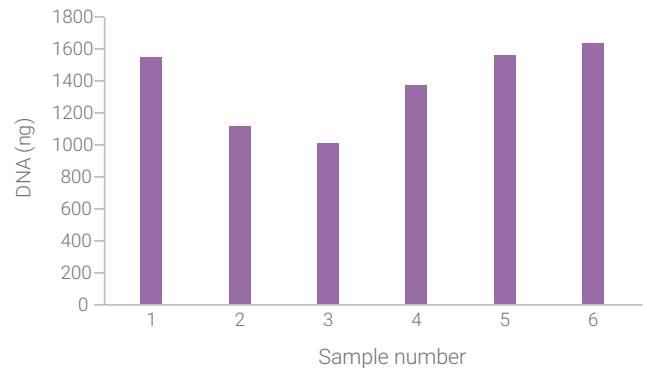
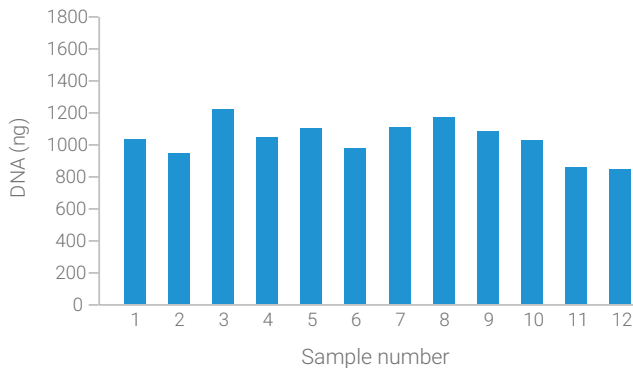
Agilent has developed a complete automation protocol for SureSelect<sup>XT</sup> library preparation and target enrichment reagents for Illumina.



- Procedures automated with Agilent Bravo NGS or NGS Workstation.
- Procedures not carried out on the Bravo deck.

# Ready to use protocols for automated NGS sample prep

DNA yields of NGS libraries prepared using SureSelect<sup>XT</sup> on the Bravo platform display higher reproducibility as shown by a lower coefficient of variance (CV) compared to manual preparation.



In a comparison of library preparation DNA yield between automated and manual protocols (left and right figures, respectively), the automated samples show a tighter reproducibility of 11 % CV compared to 18 % CV for the manually prepared samples.

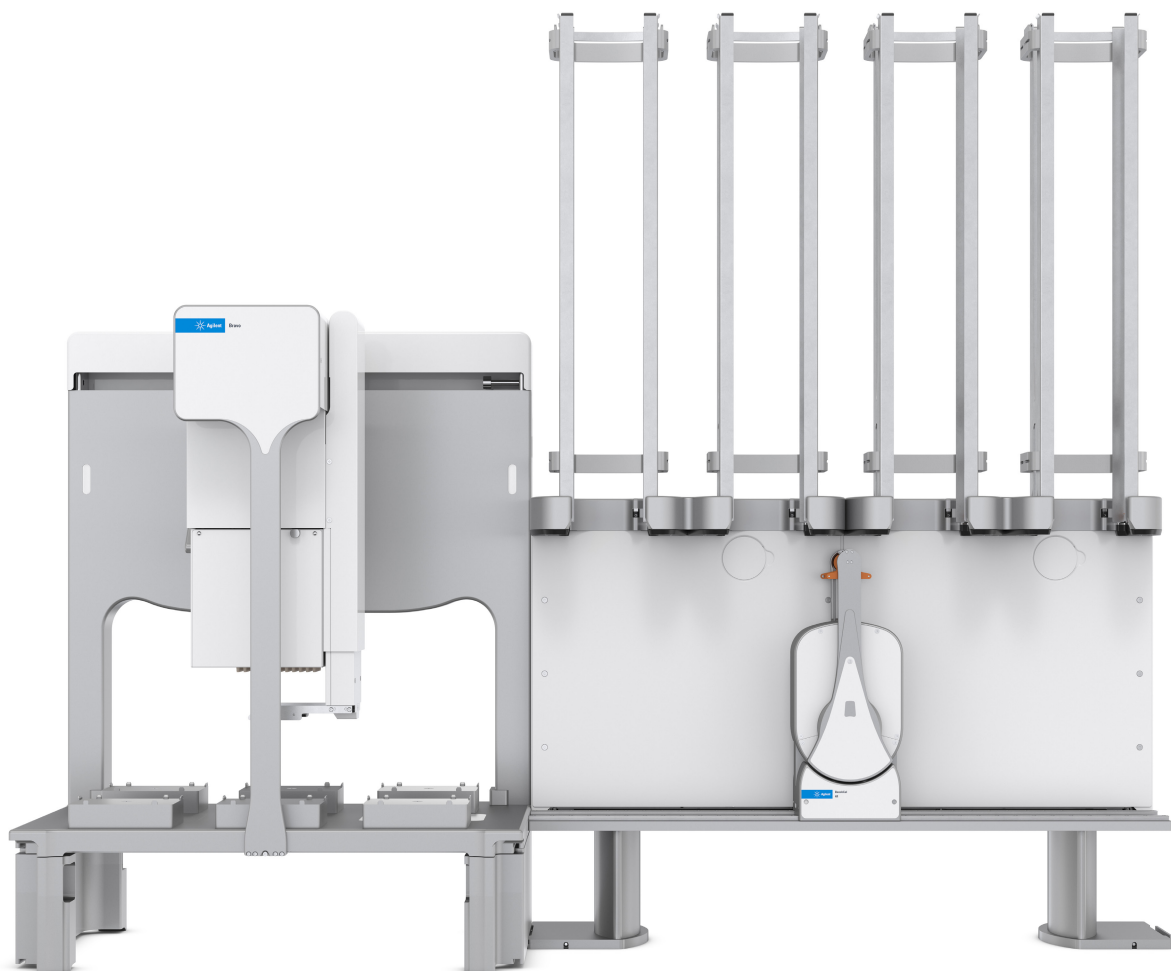


## Add higher throughput sample QC

The Agilent 4200 TapeStation system simplifies and expedites DNA or RNA quality control for NGS applications. Automated process allows for walk-away operation for up to 96 samples. The easy-to-use system delivers results at the rate of one sample per minute to increase your walk-away time.

# Versatile, Flexible, Fast

Agilent BenchCel Workstations



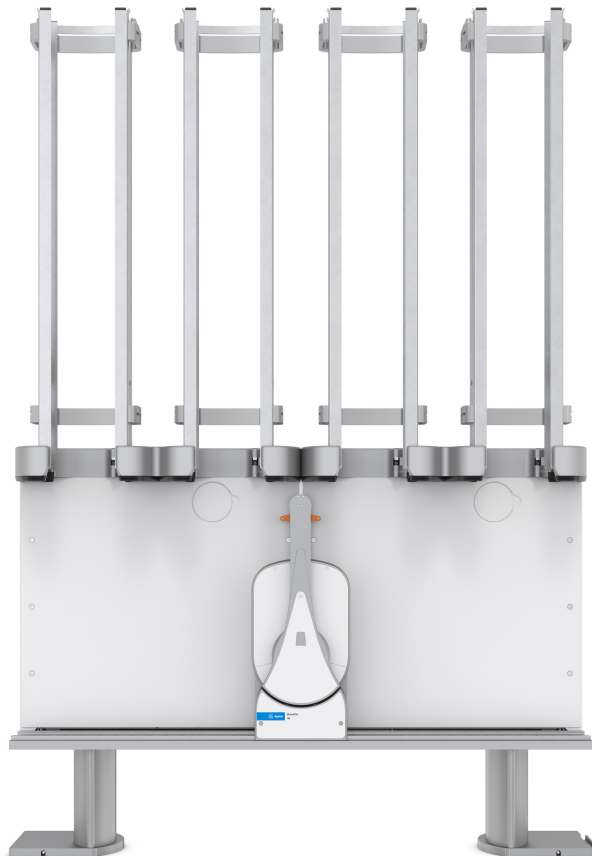
## Automation to accelerate your research

Increasing your productivity with laboratory automation should be simple and straightforward. Your choice of instrumentation shouldn't stand in your way – ease of adoption is a critical factor for getting maximum value out of automation, sooner.

### Make your routine microplate workflow easy and reliable

Agilent BenchCel Workstations are designed to offer a complete automation solution for routine research laboratory microplate workflows. Available product configurations address common microplate applications such as plate sealing, barcode labeling, serial dilution, plate replication, etc. At the center of each workstation is the Agilent BenchCel Microplate Handler.

Let Agilent take the challenges out of your routine high-throughput research lab applications and give you more walk-away time.



Agilent BenchCel Microplate Handler.

### Versatile configuration

Integrated with numerous Agilent devices, including the Agilent Bravo Automated Liquid Handling Platform

### High-speed transfers

8-second transfer time from stack to instrument

### Scalable operation

2, 4, or 6 labware rack options

### Adjustable plate capacity

Handles up to 60 standard SBS microplates per rack

### Multiple labware rack options

Top-load and front-load options available in different sizes

## Automated Plate Sealing



Agilent BenchCel Microplate Handler with PlateLoc Thermal Microplate Sealer. Some configurations are available without risers.

### Fast cycle times

Process at least three microplates/minute with no required cool down period

### Flexibility

PlateLoc automatically accommodates various ANSI-compliant microplates

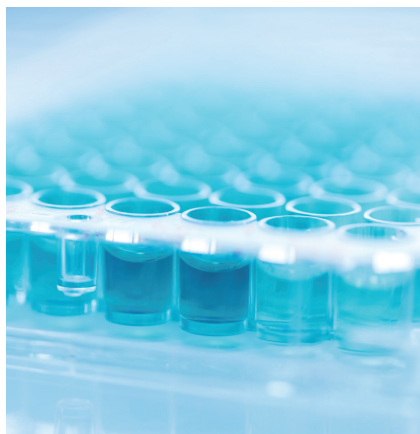
### Wide choice of microplate seal

Compatible with aluminum or optically clear seals (pierceable or peelable)

### Expandable functionality

Platform can be integrated with additional instruments to enable new applications:

- PlateLoc Microplate Barcode Labeler
- Microplate Centrifuge
- Automated Bravo Liquid Handling Platform



### Common plate sealing applications

- Pharmaceutical compound storage and screening with large volumes of microplates that require sealing
- Genomic research needing reliable and consistent seals for thermal cycling operations
- Assay supply of ready-to-use plate-based chemistry requiring sealed microplates

## Automated Plate Labeling



Agilent BenchCel Microplate Handler with Microplate Barcode Labeler. Some configurations are available without risers.

### Fast cycle times

Process at least three microplates/minute with no hands-on time

### Flexible labeling options

Add up to 4 barcode labels (1D, 2D, or human readable) per microplate

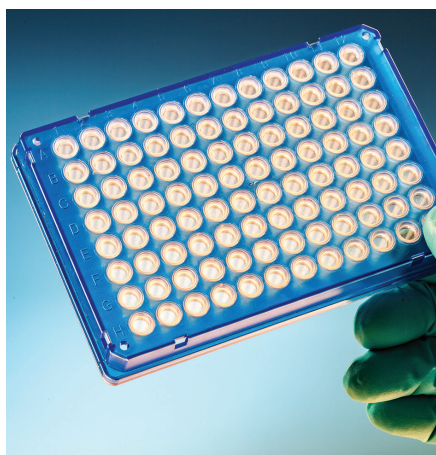
### Integrated barcode reader

Verify barcodes applied to labels, log barcode activity, or clone barcodes

### Expandable functionality

Integrate with additional instruments to enable new applications:

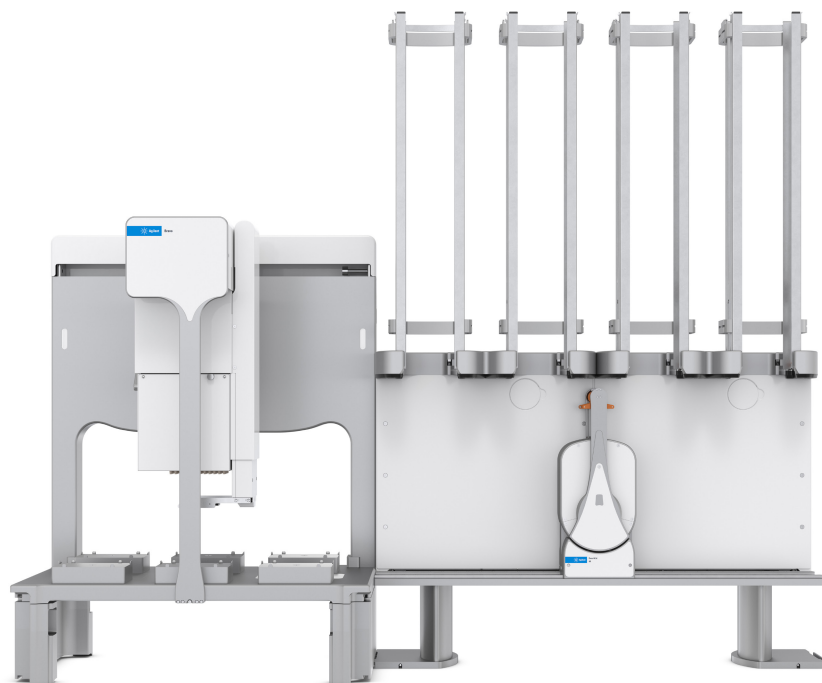
- PlateLoc Thermal Microplate Sealer
- Automated Bravo Liquid Handling Platform



### Common plate labeling applications

- Cell culture research applications processing large numbers of microplates requiring traceability
- Pharmaceutical compound storage and screening applications with high volume, on-the-spot custom labeling requirements
- Generic and custom barcoded pre-labeling for microplates
- Printing of lot numbers and other key manufacturing information for plate-based chemistry kits

## Automated High-Throughput Screening



Agilent BenchCel Microplate Handler with Bravo Liquid Handling System. Some configurations are available without risers.

### Precise pipetting

The Agilent Bravo Liquid Handling Platform achieves highly accurate and reproducible transfers for your liquid handling needs

### Multiple BenchCel configurations

Systems can be configured with different sizes of our BenchCel Microplate Handler to meet throughput requirements

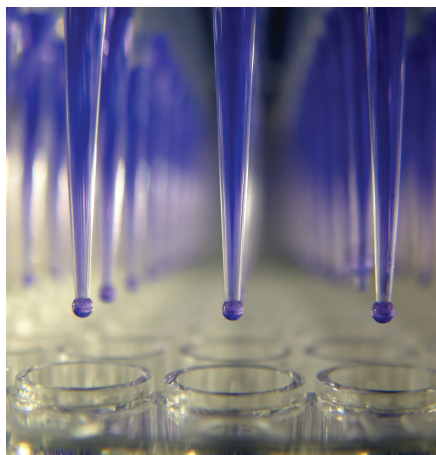
### Application versatility

Variety of Bravo on-deck accessories opens up numerous sample preparation workflows

### Expandable functionality

Integration of select Agilent devices enables additional utility and applications:

- PlateLoc Microplate Barcode Labeler
- Microplate Barcode Labeler
- Microplate Centrifuge
- Labware MiniHub



### Common high-throughput screening applications

- Compound management applications needing to create large numbers of replicates from a single-source plate
- Research screening applications needing to create general serial dilution plates for analytical testing
- Addition of plate sealing, labeling, or centrifugation for a complete automated solution

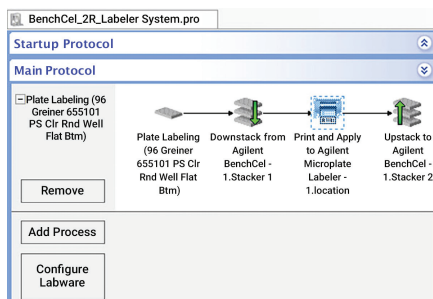
# Intuitive Software for Seamless Operation



VWorks Plate Replication Protocol Form.

All BenchCel Workstation systems are run by Agilent VWorks Automation Control Software. This software is designed to operate all Agilent devices through a single interface to simplify the user experience.

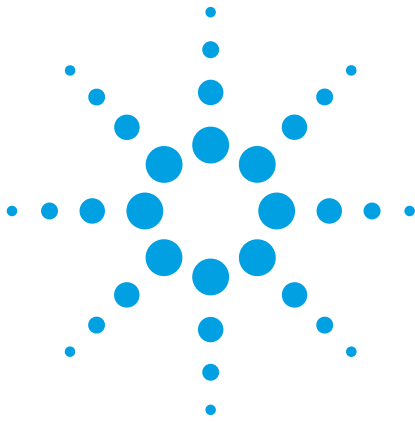
Each BenchCel Workstation is provided with standard VWorks protocols focused around standard automation procedures such as plate sealing, plate labeling, and plate centrifugation. Advanced protocols focused around serial dilution and plate replication workflows are also provided.



## Benefits of Agilent VWorks Software

- **Drag and drop tasks:** graphical icons are selected and grouped to represent the sequence of tasks in your protocol
- **Event-driven automation control:** operate multiple experiments in parallel for maximum resource utilization and throughput
- **Scalable:** single application drives standalone and system configurations with a consistent user interface that reduces training costs





# Agilent Labware Racks

## Universal BenchCel and Labware Stacker Racks

### Application Note



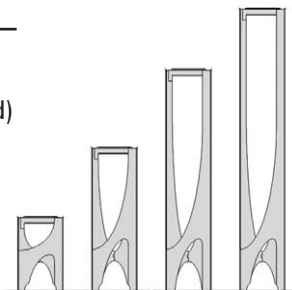
**Three rack styles**  
Standard<sup>1</sup>, Top-Load, Front Load

Agilent Automation Solutions now offers three styles of labware racks in four different capacities, universally compatible with both the BenchCel Microplate Handling System and Labware Stacker<sup>2</sup>.

Now customers have more options than ever before when choosing labware racks for Agilent instruments. A new top-loading rack with a convenient clear labware loading path and a front-loading rack with snapshot doors, both with fold-down handle for easy transportation.

All Agilent labware racks currently available are forward and backward compatible with present and legacy hardware, compatible/interchangeable with both the BenchCel and Labware Stacker and can be placed face forward or backward on instruments to conveniently load labware (ideal for BioCel Labware Stacker applications).

<b>Now</b>	<b>Formerly</b>
250 mm	(X-Short)
460 mm	(Short)
660 mm	(Standard)
860 mm	(Tall)



<sup>1</sup> Standard racks are also top-loading and are included in the price of the BenchCel and Labware Stacker. The 660 mm Standard-style rack is the default rack choice if no racks have been specified. Customers are credited the price of the Standard-style 660 mm rack if they choose to upgrade to the other styles/sizes.

<sup>2</sup> The use of all three of the rack-styles/part numbers found in this data sheet, may require a no-charge firmware update in older Labware Stackers. New gripper retrofit kits are available to update older, dedicated-BenchCel or Labware Stacker racks to make them interchangeable / shareable ("universal") on both instrument types.



## Important Information on Dimensions & Exhaust / Clean Room Hoods

All dimensions in this document are "nominal" (approximate). If you have an application where space is limited and exact dimensions are important (as in many hood applications), please contact Agilent with the make and model hood so that Agilent can obtain a CAD model of the hood for evaluation.

### Features and Benefits

**Efficient Design:** Match your high-throughput automated Workstation with quick-load racks that minimize turn-around time and maximize quick productivity.

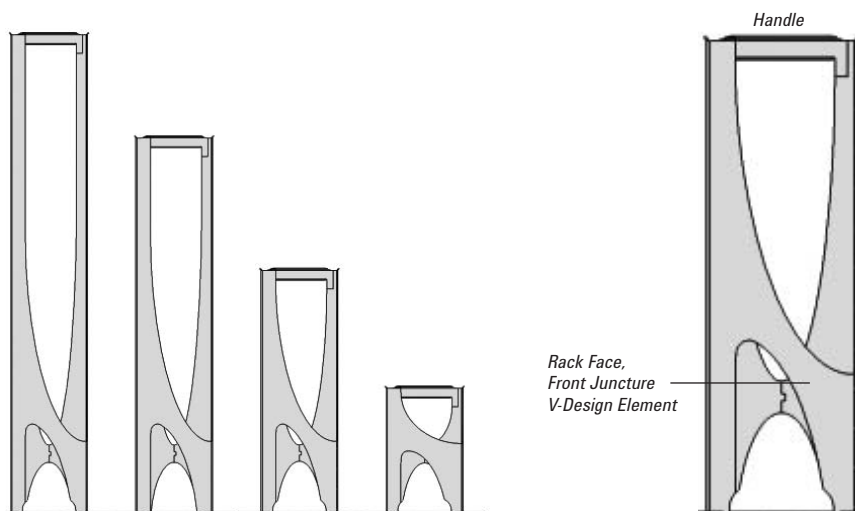
**Handle Most Labware:** Microplates, lidded microplates, deepwell microplates, PCR microplates, tube racks, tip boxes, etc.

**Extra Short and Extra Tall Racks:** You will discover that Agilent offers more choices in rack capacity because it understands real world applications, be it cramped hoods that just cannot accommodate tall racks or a demanding high-throughput application that runs night and day that you don't want to baby sit.

**Chemical Resistance:** 300-series electropolished stainless steel resists common lab spills and retains its attractive finish.

## How They Work

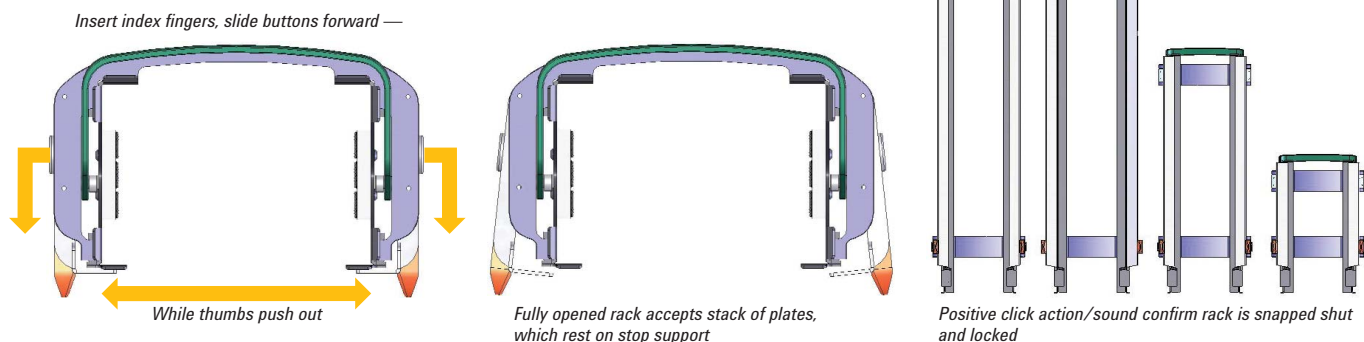
**Standard:** User picks up a stack of plates with two hands, lifts them to the top of the rack, then lowers them down with hands inserted into rack, to guide them to the bottom. As their hands reach the rack face, front juncture (V-design element), the top hand is placed below the "V" and moved up, where the plate stack is transferred. Plates are then lowered to the rack bottom where there is a physical stop to keep the plates from slipping out. To transport the rack, use the smooth, sheet metal cross-bar at the top, rear, as a handle.



**Top-Load:** User picks up a stack of plates with two hands, lifts them to the top of the rack, then lowers them down with hands inserted into rack, to guide them to the bottom. At the rack bottom there is a stop, which keeps the plates from slipping out. Carry the rack via the built-in, fold down handle at the top.



**Front-Load:** Door is opened using two hands. User places index finger into the door release button (black) on each side of rack, while sliding buttons forward, thumb tabs are used to push “doors” out to open. Plates may be loaded by placing a stack of plates directly into the open rack and resting the bottom plate on the stop support. Doors can be closed using thumb tabs/doors. Racks with labware may be transported using fold down rack handle (similar to illustration above right).



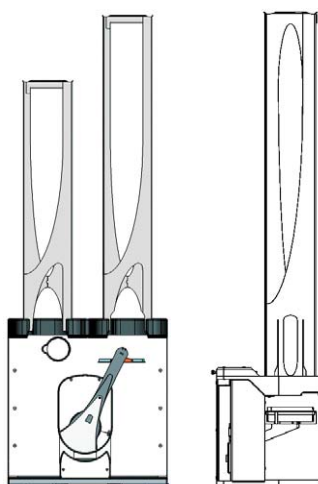
### Dimensions/Capacity

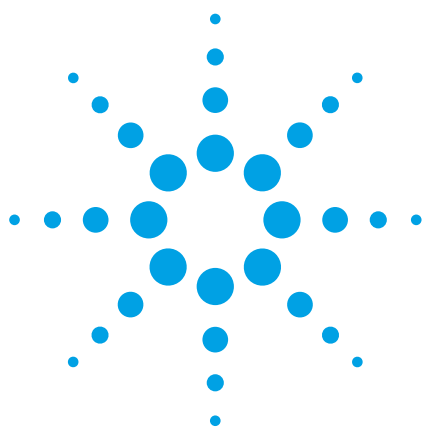
Height (mm)	Height (in)	# of 14mm Plates
250	10	17
460	18	32
660	26	47
860	34	61

$$\frac{\text{Nominal Rack Height in mm}}{\text{Labware Height in mm}} \approx \text{Rack Labware Capacity}$$

### Ordering Information

- 19578-001 Standard Rack, 250 mm
- 19578-002 Standard Rack, 460 mm
- 19578-003 Standard Rack, 660 mm
- 19578-004 Standard Rack, 860 mm
- 19580-001 Top-Load Rack, 250 mm
- 19580-002 Top-Load Rack, 460 mm
- 19580-003 Top-Load Rack, 660 mm
- 19580-004 Top-Load Rack, 860 mm
- 19579-101 Front-Load Rack, 250 mm
- Contact Agilent Front-Load Rack, 460 mm
- 19579-103 Front-Load Rack, 660 mm
- Contact Agilent Front-Load Rack, 860 mm





# Agilent PlateLoc Thermal Microplate Sealer

## Data Sheet

### Introduction

Agilent's PlateLoc Thermal Microplate Sealer is the premier thermal sealer for fast, easy, reliable microplate sealing. The PlateLoc Thermal Microplate Sealer has distinguished itself as the premier thermal sealer through its speed, small footprint, ease of use, and dependability. In designing the PlateLoc Sealer, the design engineers overcame the challenges of sealing a wide range of microplates by developing a versatile instrument that automatically accommodates deep well, assay, PCR and compound storage microplates. Stand-alone operators have full control of sealing time and temperature through the PlateLoc Sealer's touch screen, while a choice of plate stage inserts ensures the best possible seal for any microplate.

As with every Agilent Automation Solution, the PlateLoc Sealer is ideal for robotic integration, featuring an extended-travel plate stage, RS-232 serial port and ActiveX control. In order to minimize system downtime when replenishing consumables, the instrument features an easy to access, top-loading seal roll support and each new roll of seal includes a handy, seal-loading card that makes it simple and safe to install a new roll of seal. A variety of aluminum and clear seal materials are available for various applications.

### Features & Benefits

- **Easy to Operate:** Touch-screen interface allows fast and easy manual operation.
- **High Precision:** With sealing temperature control of  $\pm 2^\circ\text{C}$  and advanced seal slitting control, seal integrity will be the same for every microplate.
- **High Speed:** Fast cycle times, with no required cool down periods for rapid microplate sealing.
- **Flexibility:** Automatically adjusting to accommodate a wide range of microplates and tube racks, four types of plate stage inserts provide support for challenging microplate types.
- **Ideal for System Integration:** Smallest instrument footprint and numerous proven integrations make the PlateLoc Sealer a choice for system integrators.

### Applications

1. Compound Storage
2. Screening
3. PCR/qPCR/rtPCR
4. Sequencing



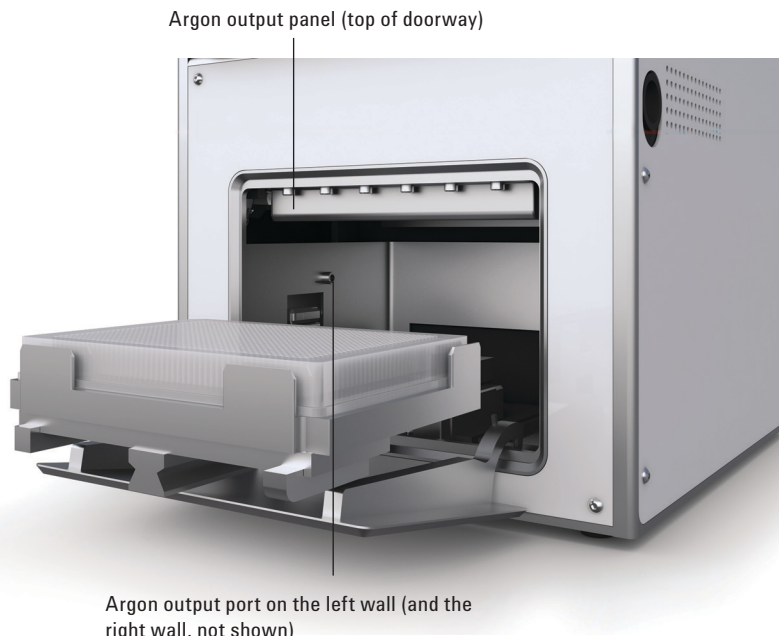
**Agilent Technologies**

## PlateLoc Options

### Option 1: Gas-Purging PlateLoc Sealer for Compound Storage

In addition to the standard Agilent PlateLoc Sealer, a Gas-Purging PlateLoc Sealer is also available, which uses inert gas such as Argon to displace air containing moisture and oxygen in the plate immediately before the sealing begins. The plate contents can be protected from hydration and oxidation for up to 24 hours. Typically used for compound storage applications, the Gas-Purging PlateLoc Sealer is best for plate contents that are sensitive to oxidation and moisture (for example, DMSO). Note: For typical polystyrene and polypropylene plates, the gas-purging effects can last up to 24 hours when the plates are stored at room temperature. The effects can last longer if the plates are stored at lower temperatures.

*Retrofits not available.*



### Option 2: Small Hotplate PlateLoc Sealer for Some PCR Plates

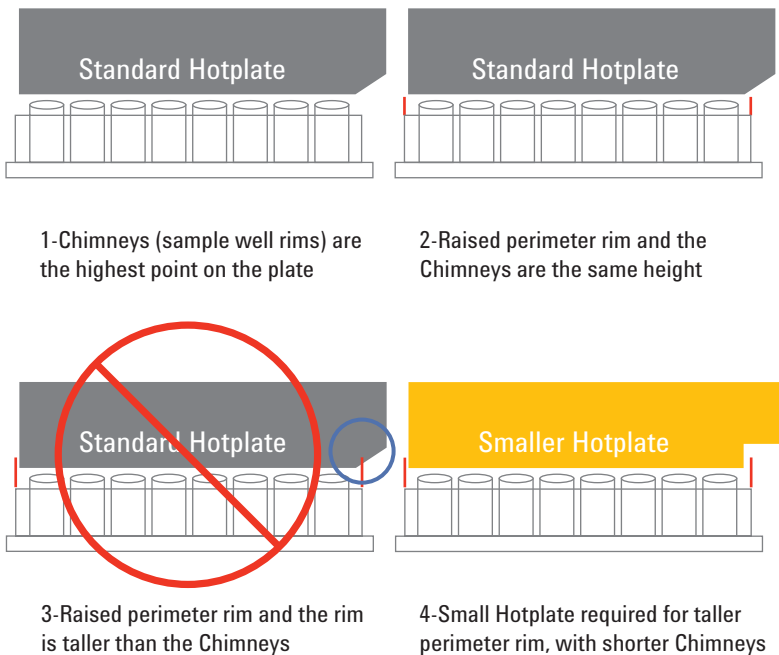
The standard rectangular hotplate within the PlateLoc, is sized to be compatible with microplates which meet the standards ANSI/SBS 1-2004 through ANSI/SBS 4-2004. The PlateLoc can also be ordered with a smaller hotplate option which may effectively seal some labware which can not be sealed with the standard hotplate.

To date, the smaller hotplate has been required by a few PCR plate designs (these PCR plates include but are not limited to):

- ABI MicroAmp Optical 96-Well Reaction Plate N801-0560, 4316813, 4306737, 4326659
- ABI 384-well Optical Reaction Plate with Barcode PN 4309849

*All small hotplate labware candidates MUST be confirmed through testing (even those listed)*

*Retrofits may be available through the Service department*



Some Common Plate Surface Topographies

# Heat Sealing Friendly Labware

## Compatible Microplates

The PlateLoc is compatible with microplates which meet the Standards ANSI/SBS 1-2004 through ANSI/SBS 4-2004 and are designed for thermal microplate sealing.

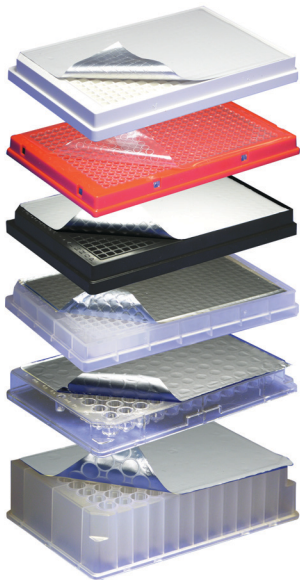
Thermal sealing compatible microplates feature raised sample well rims or “chimneys.” The PlateLoc is able to seal standard microplates in 96-, 384-, and 1536-well formats, including many deep well and PCR microplates. Skirtless and half-skirt PCR plates require Agilent **PCR Base, 96, Partial Skirt** plate support.

## Microplate Material Types

Heat seals are designed to be compatible with specific polymer (microplate) substrates such as polypropylene, polystyrene and COC. Consult the Agilent Seal Selection Guide Publication Number 5990-3659EN for complete heat seal specifications and ordering information.

## Microplate Height

Microplates as tall as 2.5 in. (63.5 mm) can be accommodated by the PlateLoc.



Seals ANSI-compliant microplates including deep well, PCR and standard microplates in 96-, 384-, and 1536-well formats.

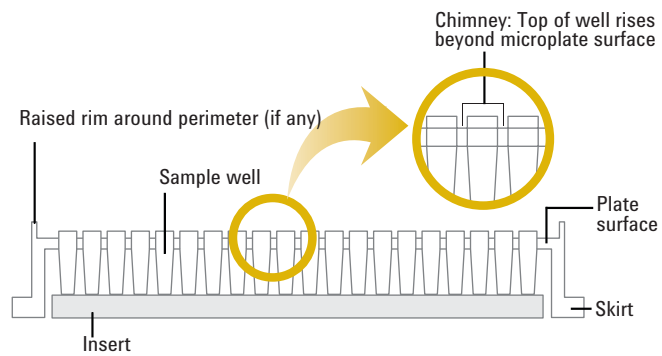


Figure 1. Microplate physical features and nomenclature

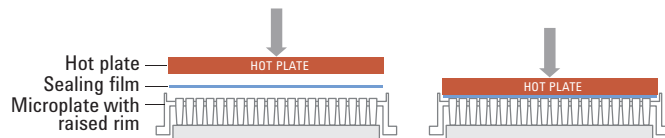


Figure 2. Above left: Pneumatics drive the hot plate down to the microplate surface. The hot plate can sense and automatically adjust for variations in microplate height. Seals are applied using pressure and heat. Right: If the microplate has a raised rim that is higher than the chimney height around its perimeter, the hot plate must fit within the rimmed area so that the hot plate can make uniform contact with the seal and all sample wells simultaneously.

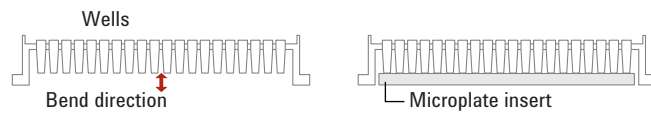


Figure 3. Microplate without and with insert. Support inserts help ensure a flat sealing surface by supporting the sample well bottoms—they are especially helpful with highly flexible or warped plates.

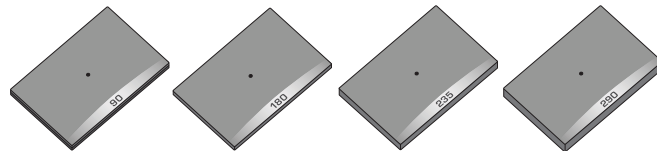


Figure 4. Standard inserts. The number on the inserts indicates the thickness of the metal pad (for example, 180 means 0.180 in thick). Note: The 90 insert has a 0.090-in metal pad with foam padding on the microplate-facing side and is used with microplates that require flexible support.

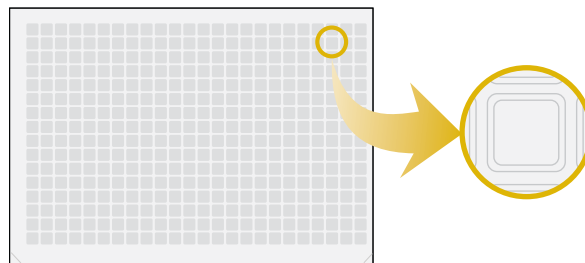
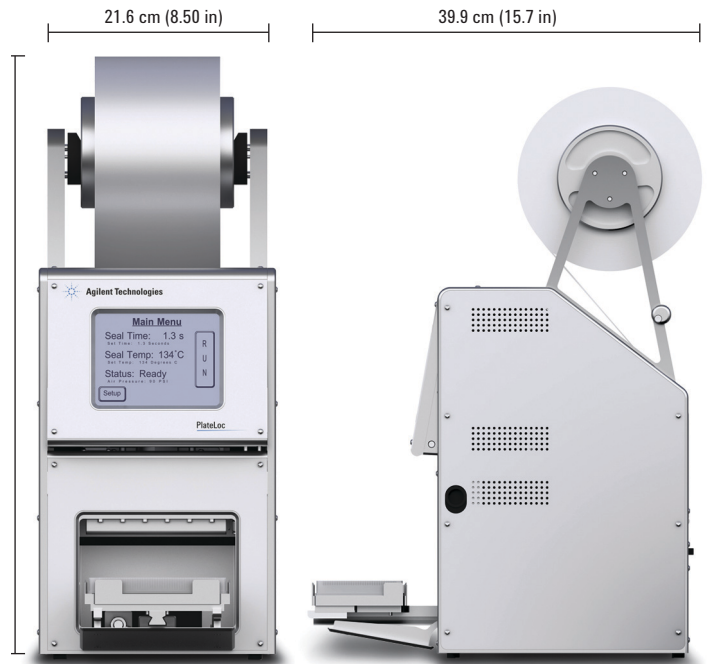
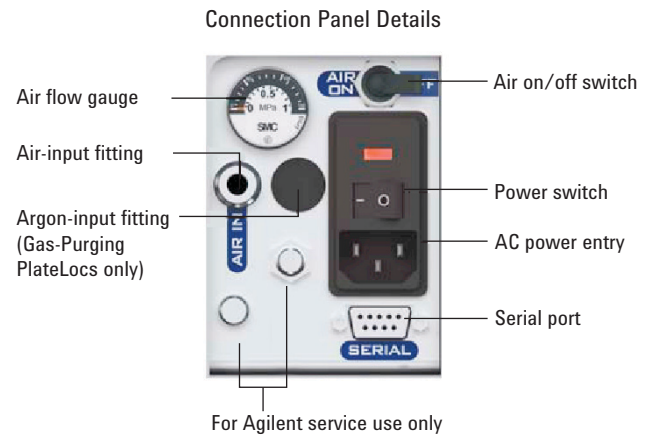


Figure 5. Confirming a quality seal application. Allow a peelable seal to set for a minimum of 10 seconds prior to peeling. Then examine the bottom/sealing surface of the heat seal and look for intact and continuous sample well rim (“chimney”) impressions.

# Key PlateLoc Features/Components



**Dimensions:**  
 Height: 58.4 cm (23")  
 Width: 21.6 cm (8.5")  
 Depth: 39.9 cm (15.7")  
 Weight: 20 kg (45 lbs)



## Specifications

<b>Certification</b>	CE Certified
<b>Microplate Height</b>	
Standard PlateLoc	Microplates up to 51 mm (2 in.)
PlateLoc with gas purge option	Microplates up to 51 mm (2 in.)
<b>Computer/Software Requirements</b>	
Host Computer	Not required for manual operation; Windows 7 for VWorks
Software	Agilent VWorks Automation Control software when part of an Agilent lab automation workstation/system (VWorks software is not included in standalone instrument purchases) ActiveX CD included with all PlateLocs to facilitate integration when using third-party automation software to control the PlateLoc
Interface	RS-232 Serial Port with DB9 connector
<b>Dimensions / Weight</b>	Please see diagrams in this document
<b>Heat Seal</b>	Download PlateLoc Thermal Microplate Sealer Consumables Selection Guide PDF document, publication number 5990-3659EN
<b>Labware Compatibility</b>	
Microplates	Which meet the Standards ANSI/SBS 1-2004 through ANSI/SBS 4-2004 and are thermal sealing compatible (feature raised sample well rims or “chimneys”)
<b>Operating Requirements</b>	
Air	70 LPM at 6.2 bar (2.5 cfm at 90 psi) [Clean, dry, oil-free]
Electrical	Operating AC Current (typical) 100 – 120VAC, 50/60 Hz,      200 – 240VAC, 50/60 Hz
Inrush	20A/120V                              40A/240V
Current (typical)	4A/120V                                2.5A/240V
Environment	4-40°C; 10-90% RH, non-condensing
<b>Performance</b>	
Cycle Time	Approximately 8 seconds per plate
Warm-up Time	2.5 minutes
Cool-down Time	1 hour (from 160°C to room temperature)
Sealing Temperature	30 to 200°C
<b>Sealing Technology</b>	Thermal, roll fed Not designed for manual, individual cut sheet heat sealing Not compatible with PSA Pressure Sensitive Adhesive-based sealing films
<b>Warranty</b>	12 month instrument warranty - See Terms of Sale document
<b>What's in the Box</b>	<ul style="list-style-type: none"><li>• PlateLoc Thermal Microplate Sealer (G5402A/G)</li><li>• One full roll of user's choice of heat seal - must be specified at time of order</li><li>• Seal roll mount - 2-hubs (G5550-02649) and 1-axle (G5550-02799)</li><li>• Set of four Microplate Support Inserts (15818-002)</li><li>• Microplate stage (G5550-22756)</li><li>• Air Connection Kit (N. American G5550-23870 or Metric G5550-23871)</li><li>• RS-232 DB9 Serial Cable (G5550-02797)</li><li>• Power cord (8120-1378 USA or Misc. PNs for Other Countries)</li><li>• PlateLoc User Guide (G5402-90001)</li><li>• ActiveX CD (Does not include VWorks software) (G5550-11979)</li></ul>



## Ordering Information

Part No. (Instrument Order/ Configuration)	Part No. (Agilent Internal Use Only)	Description	Part No. (Standalone Purchase of Component Only)
<p>Important Note on Instrument Voltage: The Agilent Business Center will use the Ship To address you provide to automatically select the appropriate instrument voltage. If you are an integrator, reseller or distributor that require a specific voltage instrument–NOT related to the Ship To address, it is your responsibility to let your Agilent sales professional or the Business Center know your special requirements.</p>			
G5402A/G		<b>PlateLoc Thermal Microplate Sealer</b> <i>Compact, high speed, automated microplate sealer controlled by touchpanel or PC.            Please specify choice of free seal.</i> PlateLoc, 120V PlateLoc, 230V	Not Applicable
	01867-201 01867-202		
G5402A/G Option 225		<b>PlateLoc, Gas Purging</b> <i>Typically used with inert gas such as Argon to displace air containing moisture and oxygen immediately before sealing begins when plate contents are in DMSO solvent in pharma compound storage.</i> PlateLoc, 120V, Gas Purging PlateLoc, 230V, Gas Purging	Not Applicable
	01867-251 01867-252		
G5402A/G Option 226		<b>PlateLoc, Smaller Hotplate</b> <i>Typically required by some PCR plates where a raised perimeter rim prevents the standard hotplate from making good thermal contact with the heat seal/plate. Most other microplates compatible with the standard PlateLoc hotplate can also be sealed.</i> PlateLoc, 120V, Hotplate, small PlateLoc, 230V, Hotplate, small	Not Applicable
	G5402-60014 G5402-60015		
G5402A/G with Options 225 & 226		<b>PlateLoc, Smaller Hotplate and Gas Purging</b> PlateLoc, 120V, GP, Hotplate, small PlateLoc, 230V, GP, Hotplate, small	Not Applicable
	G5402-60016 G5402-60017		
<b>Misc. Related Components</b>			
Please see <b>PlateLoc Thermal Microplate Sealer Consumables</b> (Heat Seal) <b>Selection Guide</b> Document 5990-3659EN for consumables ordering information, part numbers, detailed specifications.			
		<b>G5402A PlateLoc, Shipping Carton Kit</b> Original packaging kit to return instrument to factory for Depot service repair, etc.	G5402-60043
Not Applicable	G5550-22756	<b>Current PlateLoc Plate Stage</b> (Plate Transfer Nest, Thinned, Tall Tabs) (One required and supplied with PlateLoc instrument) Spare/replacement part.	G5550-22756
G5550-19632	G5550-19632	<b>Legacy PlateLoc Plate Stage</b> (Plate Transfer Nest, BC, BioCel, Element) This component must be ordered through the PlateLoc Product Manager. It is intended for use with a small number of robotic grippers unable to pick or place a microplate in the Current PlateLoc Plate Stage. Customers will need to provide make and model robot/gripper details with inquiry.	G5550-19632
Not Applicable	15818-002	<b>PlateLoc Support Inserts, Set of Four</b> (One set supplied with PlateLoc instrument) Appropriate thickness plate is placed under the microplate to support the bottom of the sample wells--which in turn, can help compensate/adjust/ flatten many warped microplates for optimum sealing.	15818-002
Not Applicable	18631-001	<b>PlateLoc Support Inserts, A La Carte</b> Plate Insert, Flexible, .090 (one included in 15812-002)	18631-001
Not Applicable	G5550-12875	Plate Insert, .180 (one included in 15812-002)	G5550-12875
Not Applicable	G5550-12879	Plate Insert, .235 (one included in 15812-002)	G5550-12879
Not Applicable	G5550-12880	Plate Insert, .290 (one included in 15812-002)	G5550-12880
19385-001	19385-001	<b>Specialty Inserts Not Included with PlateLoc</b> Plate Insert, .500	19385-001
16664-101	16664-101	Plate Insert, Flexible, Labcyte	16664-101
17708-101	17708-101	Plate Insert, Flexible, Aurora 1536	17708-101
G5402-20000	G5402-20000	PCR Base, 96, Partial Skirt	G5402-20000
		<b>Hot Plate Assemblies for Retrofit</b> <i>These are the parts that an Agilent FSE Field Service Engineer or the Service Depot would install to retrofit an existing PlateLoc to a <b>PlateLoc, with Smaller Hotplate</b>. Contact the Agilent Automation Solutions business unit Service Department for a complete quotation which includes, parts, labor and any potential travel charges.</i>	
G5550-21437	G5550-21437	Hotplate Assembly, 110 volt, small	G5550-21437
G5402-60021	G5402-60021	Hotplate Assembly, 230 volt, small	G5402-60021

## Additional Helpful Information Resources

### Collateral



#### **Agilent BenchCel Workstations. Microplate Sealing Solution – Application Bulletin**

Agilent Automation Solutions integrates a wide range of instruments with the BenchCel Microplate Handler to create flexible benchtop automation solutions. An Automated Microplate Sealing Workstation can be created using two Agilent instruments: the BenchCel Microplate Handler and the Agilent PlateLoc Thermal Microplate Sealer. With a capacity of two to six labware stacking racks, a PlateLoc Sealer and BenchCel system can automate the sealing of hundreds of microplates and provide walkaway convenience.

Publication Number 5990-3631EN

#### **PlateLoc Thermal Microplate Sealer – Quick Reference Guide**

This document provides quick-reference guidelines for optimizing seal quality and FAQ Frequently Asked Questions on the PlateLoc and heat sealing. This guide should be used in conjunction with the PlateLoc Thermal Microplate Sealer User Guide and the PlateLoc Seal Selection Guide.

Publication Number G5402-90003

#### **Request for PlateLoc Sealer Applications Support**

Single paged PDF which may be completed on-line and forwarded to Agilent Technical Support/Applications for assistance. Helps gather contact information and helpful information need to help optimize the required time/temperature for a specific plate or other applications-based challenges.

Publication Number G5402-90004

#### **Agilent Laboratory Automation Consumables – Selection Guide**

An introduction to Agilent Laboratory Automation Consumables (Tips, Heat Seal, Labels, etc.). Presents the features and benefits of using Agilent consumables.

Publication Number 5990-4651EN

#### **Agilent Thermal Microplate Sealer Consumables Selection Guide**

Includes official product descriptions and part numbers, time/temperature starting point sealing recommendations, recommended applications and complete technical specifications for the full range of PlateLoc heat seal.

Publication Number 5990-3659EN

#### **PlateLoc Thermal Microplate Sealer User Guide**

Instrument manual which ships with each PlateLoc. Includes information on installation, setup and operation of the instrument.

Publication Number G5402-9001

### Videos

#### **Agilent PlateLoc - How it Works Video**

*Fast, dependable microplate sealing with Agilent's compact PlateLoc Thermal Microplate Sealer are demonstrated and discussed in both walk-up manual and automated modes.*

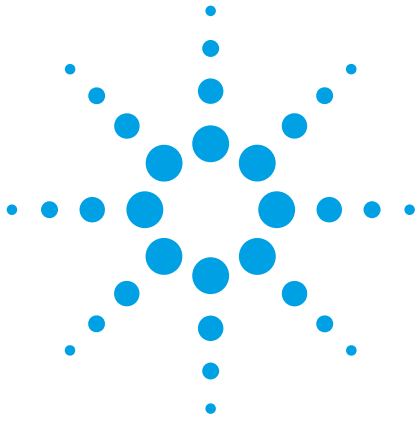
Use website search box to locate "**PlateLoc Thermal Microplate Sealer Video**"

(1 minute 32 seconds)

### Miscellaneous

#### **2D and 3D PlateLoc Exterior Drawings**

*Contact your Agilent sales professional or Automation Solutions Technical Support for assistance (No CDA Confidentiality Agreement required)*



# Agilent Microplate Labeler

## Data Sheet



### Applications

1. Print 1D (linear) barcodes, 2D barcodes and human readable content on adhesive labels
2. Apply adhesive labels with printed content on microplates
3. Verify 1D (linear) barcodes and 2D barcodes when used with a barcode reader
4. Create data clones and log microplate activities when used with a barcode reader

### Introduction

When introduced in 2000, the original Agilent Microplate Labeler G5404A quickly became a widely-used platform for on-demand, barcode print-and-apply applications in the life sciences. The **Agilent Microplate Labeler G5404B/G** retains the easy-to-integrate form factor, speed and proven label applicator, and combines it with the next generation in thermal label printers, featuring a design optimized for

- Small labels
- Repeatable label presentation position
- Automated label applicators
- Extended MTBA (Mean Time Between Assists)

### How is this repeatability and reliability achieved?

- Improved registration — ideal imaging and picking positions
- Custom small label peeling mechanism
- Tensioned peeling system — ensures label backing stays taut
- Buckling-resistant die-cast aluminum chassis
- Agilent's certified, designed-for-automation, clear-backed, adhesive labels

### Additional product enhancements include

- Provides 600 dpi high resolution, crisp images and more flexibility in sizing codes
- Reduced particulate generation — via cleaner label backing
- Bright, easy-view transparent printer cover
- 100-240 volt auto switching power supply

**Walkaway Time = Printer Reliability + Applicator Reliability + Consumables Reliability**

*Laboratory automation is our business. We're listening and understand the goal: speed-to-opportunity. Agilent helps your lab get there with fast, dependable products and services of high value.*



**Agilent Technologies**

## Modes of Operation

**Standalone:** The Microplate Labeler can be operated in a standalone (manual) mode in which the user loads and unloads microplates from the microplate stage. This mode requires the use of a host PC running the powerful labeling application, PlateTag, which is included with the instrument. Although used in a manual mode, the Microplate Labeler coupled with the PlateTag software allows the user to leverage these benefits of automation:

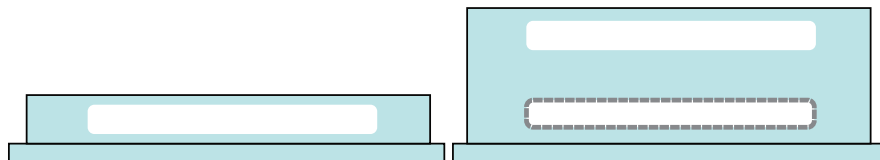
- Print and apply up to four labels per plate on any size batch of plates
- Use databases, files, or counters to define unique data to be automatically printed on each successive label
- Use constants to put the same data on multiple labels without needing to type that data multiple times
- Use the optional barcode reader to clone data from existing labels onto new labels
- Use the optional barcode reader to verify data on each label after application to the plate

### Automated in Agilent

**Workstations/Systems:** When automated in an Agilent System or Workstation, the Microplate Labeler is controlled by the flagship software application, VWorks. Providing the widest range of instrument and applications support, VWorks allows complete automation of the labeling function when used with a compatible microplate handler such as Agilent's BenchCel. In addition to automating the plate handling for the labeling process, VWorks offers a broad variety of data integration options, supports the use of multiple Microplate Labelers, and provides innovative error-handling.

### Integrated into a 3rd Party Automation

**System:** ActiveX control software is provided with each Microplate Labeler allowing the instrument to be incorporated into an integrator's own host automation software. The instrument features an RJ45 Ethernet port to enable communication with the host PC.



End-user has a choice of two convenient automated placement positions. Left microplate features centered label placement, right microplate could have label in the same relative position (label with dotted line), centered relative to this microplate's height or placed higher towards the top of the microplate.

## Barcodes, data sources

With the optional integrated barcode scanner option, you can instantly create data clones or log microplate activity.

Bundled software can access a variety of data sources, including comma- or tab-delimited files and spreadsheets, and can be integrated with an ODBC-compliant LIMS.

## Labware Compatibility

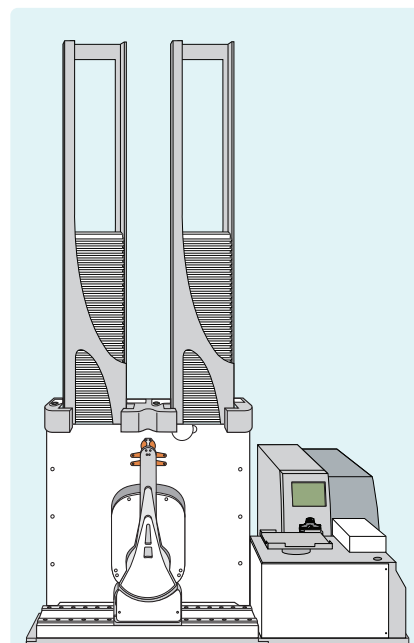
The Agilent Microplate Labeler accommodates a wide range of microplates that meet the ANSI Standards ANSI/SBS 1-2004 through ANSI/SBS 4-2004. Compatible labware range includes many deep-well microplates, full-skirt PCR microplates and tube racks.<sup>1</sup> A two-position microplate stage allows for two vertical label application positions that automatically adjust for labware with special requirements such as tall microplate skirts or tall deep-well microplates.

## Compact size and speed

The Microplate Labeler's compact size fits easily on a benchtop, while its speed allows users to achieve aggressive throughput goals. The 600-dpi thermal transfer printer allows the Microplate Labeler to print up to six fields (of machine or human readable content) per label.

## High quality consumables

Labels and ribbons designed and tested for laboratory use, withstand exposure to wide temperature ranges (-80°C to 100°C) and various reagents including DMSO—important features in many biotech applications



## Automated Labeling Print-and-Apply Solution

For high-throughput labeling needs, the Agilent Microplate Labeler can be integrated with the Agilent BenchCel Microplate Handler. The BenchCel allows up to 360 plates to be labeled at one time, at a rate of three microplates per minute, making quick work of even the tallest stack of microplates.

## Features & Benefits

- **Flexible Label Formats:** The Microplate Labeler offers a wide range of fonts, linear barcodes, 2D matrix codes and magnifications for maximum flexibility; users can label up to four sides of most compatible labware using a variety of data input sources.
- **Easy to Integrate:** With a small footprint, an easy-to-access plate stage, and straightforward device drivers, the Microplate Labeler is an excellent choice for integration projects.
- **High Speed:** The Microplate Labeler can repeatedly print and apply labels at speeds of up to one label every 4 seconds.
- **Machine Code Verification:** With the optional barcode reader, the Microplate Labeler can verify and reapply barcode labels. The barcode reader can also be used to clone existing labels or for systematic microplate tracking.



Optional barcode reader/arm assembly.

## Specifications

**Cycle Time:** Less than 4 seconds per label

**Printer Resolution:** 600 dpi

**Label Application:**  $\pm 1.0$  mm horizontally and  $\pm 0.5$  mm vertically

**Symbologies:** Code 128

Code 39 (full ASCII)

Interleaved 2 of 5

Codabar

Code 93

HIBC

Data Matrix (2D)

PDF 417 (2D)

Micro PDF 417 (2D)

### Labware Compatibility Microplates:

Microplates that meet the ANSI Standards ANSI/SBS 1-2004 through ANSI/SBS 4-2004

## Operating Requirements

**Electrical:** 100–240 VAC, 50–60 Hz, 2.75A

**Air:** 70 Lpm at 5.5 bar [2.5 cfm at 80 psi]

### Software:

Use Microplate Labeler Diagnostics for real-time, manual control (setup/troubleshooting). Employ PlateTag Software to process plates with the Microplate Labeler in a stand-alone mode. Use Agilent VWorks software when part of an Agilent lab automation system. Utilize ActiveX commands when using third-party software to control the Microplate Labeler.

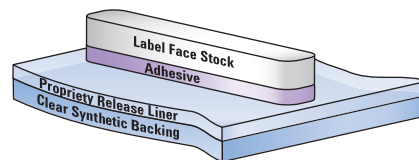
**Requires G5404B/G Microplate Labeler enhanced software (VWorks, BenchWorks, PlateTag, ActiveX) — contact Technical Support or your Agilent Technical Sales Professional for details on available upgrades for your software platform.**

**Controller:** PC running compatible software per above

**Interface:** 10 BaseT Ethernet Port (Recommended), RS-232

**Certification:** CE certified

**Label Media:** Agilent Microplate Labeler certified, designed-for-automation, adhesive labels plus high performance, application-matched ribbon for biotech applications.



Agilent's second generation, **Microplate Labeler** automation-certified labels with application-matched ribbon guarantee the highest level of system performance and superior instrument and applications support

**Label Dimensions:** 50.8 mm W x 6.35 mm H [2 in x 0.25 in]\*

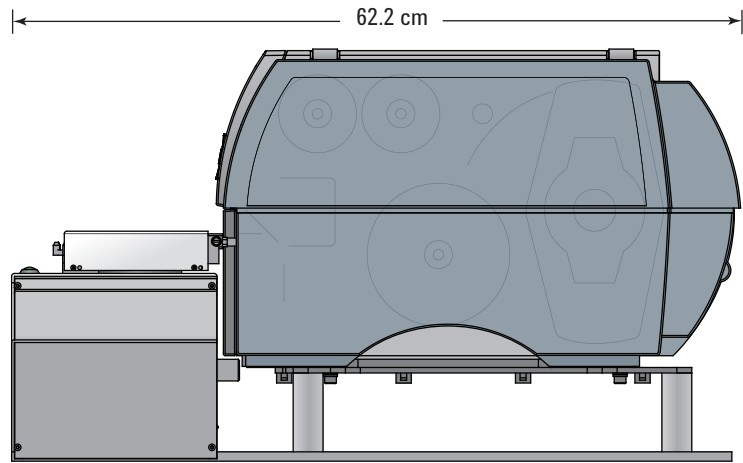
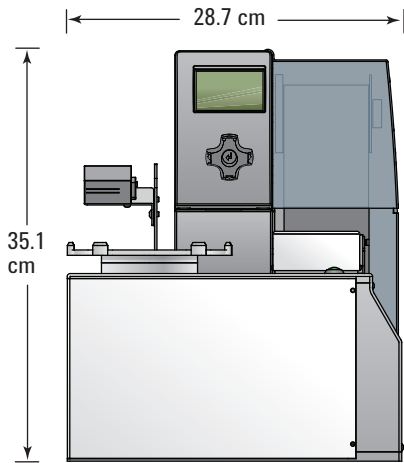
\* The instrument design has been optimized for the use of this Agilent standard label size. For non-standard labels, contact the Agilent Automation Solutions Technical Support Team or an Agilent Technical Sales Professional for additional information or to discuss your requirements.

**Roll Length:** 6,500 or 13,000 labels per roll.

Labels are sold with enough ribbon to print the corresponding amount of labels in Agilent G5404B/G Microplate Labeler "Media Kits."

**Temperature Range:**  $-80^{\circ}\text{C}$  to  $100^{\circ}\text{C}$

**Durability:** DMSO and acetone resistant

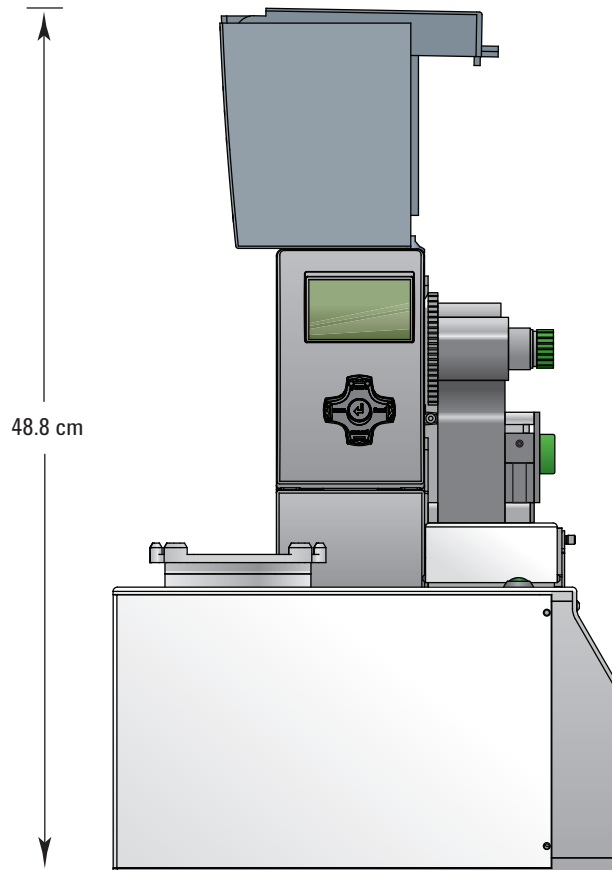


**Dimensions:**

Width: 28.7 cm [11.3 in]  
Depth: 62.2 cm [24.5 in]  
Height: 35.1 cm [13.8 in]  
Weight: 21 kg [46.7 lbs]

**View of Instrument with Open Hinged Cover for Consumables Replacement**

*(Users with height constraints may choose to operate instrument with snap-off see-through cover removed when instrument is placed within a safety enclosure free from aggressive chemicals or vapors)*



Part No. (Instrument Order/Configuration)	Description	Part No. (Standalone purchase of component only)
G5404B/G	<b>Microplate Labeler.</b> High speed, microplate label printer/applicator, for robotic integration or stand-alone operation. Variety of symbologies, fonts, and magnifications. (Includes 1 ea. 6.5K Media Kit)	Not Applicable
G5404B/G Option 260	<b>Labeler Barcode Reader (1D).</b> Verify or clone linear (1D) barcodes. Includes mounting arm and cable.	08332-101
G5404B/G Option 264	<b>Labeler Media Kit 0.25" 6.5K.</b> Ribbon & labels for 6,500 labels. DMSO resistant, -80°C to +100°C. 6.35 mm H x 50.8 mm W. 0.25" H x 2" W. Compatible w/06497-001, 0.25" Vac Pads. (Includes 6,500 labels and ribbon to print 6,500 labels)	G5404-60005
G5404B/G Option 267	<b>Labeler Media Kit 0.25" 13K.</b> Ribbon & labels for 13,000 labels. DMSO resistant, -80°C to +100°C. 6.35 mm H x 50.8 mm W. 0.25" H x 2" W. Compatible w/06397-001, 0.25" Vac Pads.	G5404-60013
<b>Misc. Related Components</b>		
	<b>Labeler, Shipping Carton Kit.</b> Original packaging kit to return instrument to factory. (Intermec-printer based platform only.)	G5404-68000
	<b>Labeler, Shipping Carton Kit.</b> Original packaging kit to return instrument to factory. (CAB A2+ printer based platform only.)	G5404-68001
G5474A	<b>Labeler Upgrade.</b> Parts & Labor to replace/upgrade printer. G5404A Intermec-based Labeler to G5404B CAB A2+-based. Includes CAB printer, risers, etc.	
	<b>Labeler Vac Pad Kit .25".</b> Vacuum pads for .25" (6.35mm) high labels. Maintenance spare, replace when stiff/cracked. Set of six. End-user replaceable. (Suction cups used to pull label off backing.)	06397-001

## Microplate Labeler Data Sheet Notes:

**1. Labware Compatibility.** The use of this instrument platform requires the use of microplates that meet the ANSI Standards ANSI/SBS 1-2004 through ANSI/SBS 4-2004. Since customer application requirements can vary, customers should make an effort to confirm the suitability of this product for their needs as Agilent does not warrant or make claims as to the suitability of an instrument for customer applications. Product Specialists and Application Scientists are available to assist the customer in determining if the instrument is a good match for the workflow under consideration.

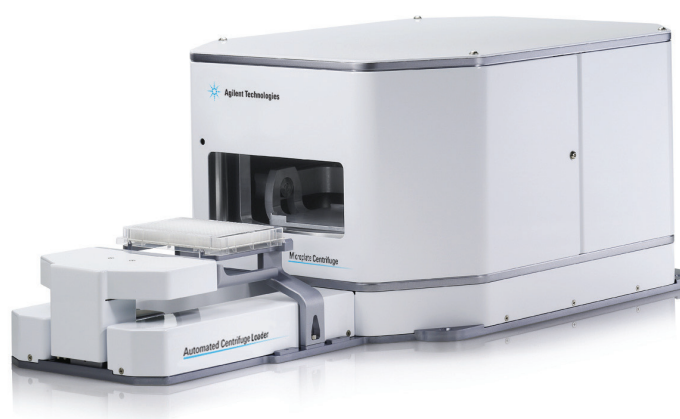
**2. 3rd Party Media:** Labels and Ribbons. The performance of the Agilent Microplate Labeler has been optimized using Agilent media. If you choose to try third-party labels or ribbons and experience poor performance/instrument problems and contact Agilent for

support, it is your responsibility to immediately notify the Agilent support representative that you are using third-part media. Use of third-party labels and ribbons may be outside the scope of the terms of the Microplate Labeler instrument warranty and may result in the user paying for any necessary repairs and applications support, as a result of using these materials. If you are considering the use of third-party consumables because the Agilent consumables do not meet your requirements, please give Agilent the opportunity to try to help.

**3. Reference.** This information is for reference only and subject to change.

Instrument Warranty: One year. Details are available on the Agilent website.

## Agilent Microplate Centrifuge



### Applications

- Filtration protocols for PCR purification
- Cell harvesting for plasmid preps
- Condensate spin-down for post-PCR processes
- Removal of air bubbles in high-density plates

### Introduction

The Agilent Microplate Centrifuge is a small robot-accessible automated centrifuge. It also provides both vibration and noise control in a small, low-maintenance package. Ideal for high or medium-throughput applications. The Microplate Centrifuge is capable of rapid acceleration and deceleration (a customizable setting), minimizing the required cycle time. It is excellent for filtration protocols, air bubble removal in high-density microplates and spin-downs including cells and cellular debris. A solid and efficient design allows Microplate Centrifuge units to be stacked to save space. The door design allows for access to the buckets by a range of articulated robots, for high throughput applications. For robots that cannot reach through the door, the Automated Centrifuge Loader allows unobstructed accessibility. With a three-second loading time and robust motion control, the Automated Centrifuge Loader can be accessed by most laboratory microplate handlers/robots.



## Features and Benefits

- **Compact Footprint:** The Agilent Microplate Centrifuge takes up very little bench space, and fits easily in integrated systems.
- **Accessibility:** With the Automated Centrifuge Loader, the Microplate Centrifuge can be integrated with many robotic systems.
- **Stackable Design:** Multiple Microplate Centrifuge units can be stacked on each other, increasing the system throughput without adding to the footprint.

## Additional Information

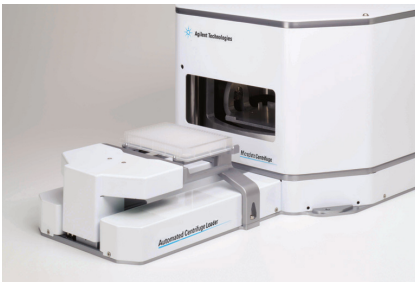
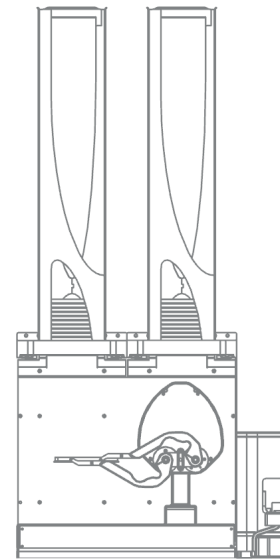
### Workstations

- Automated Spin-down Station
- BenchCel Microplate Handling System with Microplate Centrifuge and Automated Centrifuge Loader

When batches of microplates need to be spun down at one time, this spin-down station is a good choice. The Microplate Centrifuge integrates easily with the BenchCel Microplate Handler providing walkaway convenience. A simple software interface allows users to specify the centrifugation settings and with the click of the mouse, the BenchCel Platform and Microplate Centrifuge take care of the rest.

### Optional Microplate Loader

Automated Centrifuge Loader load sequence begins with automated door opening, microplate lifted by the Automated Centrifuge Loader to facilitate robotic microplate hand-off, and placement into one of two internal centrifuge microplate carriers.



## Specifications

Table 1. Specifications

Top Speed/g	3,000 RPM/1,000 g
Maximum Payload (per bucket)	250 g [8.8 oz]
Acceleration/Deceleration	7.5 sec 0–3,000 RPM
Maximum Imbalance	10 g [0.35 oz]
Capacity	Two microplates or tube racks
Labware Compatibility Microplates	All ANSI-compliant standard microplates including deep well microplates, PCR microplates, and tube racks
Maximum Microplate Height	4.83 cm [1.90 in]

## Operating Requirements

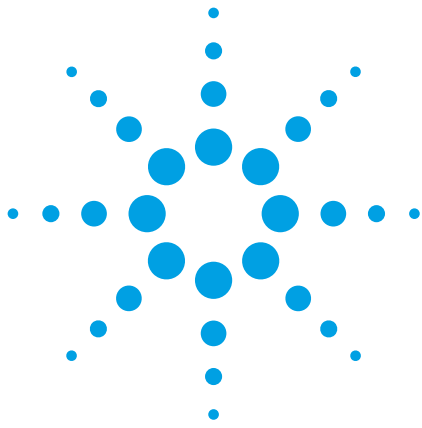
Table 2. Operating requirements

Electrical	100–240 VAC, 50/60 Hz, Operating AC Current 7A/120V or 3.5A/240V (typical), Inrush Current 20A/120V or 40A/240V (typical)
Air	28 Lpm at 5.5 bar [<1 cfm at 80 psi]
Environment	4–40 °C
Controller	PC with Windows 2000, XP or other VWorks Compatible Operating System
Interface	RS-232 serial port with a DB9 pin connector
Certification	CE certified

Table 3. Dimensions

Microplate Centrifuge	
Height	20.6 cm [8.1 in]
Width	32.8 cm [12.9 in]
Depth	45.7 cm [18 in]
Weight	26 kg [58 lb]
Agilent Microplate Centrifuge with Automated Centrifuge Loader	
Height	24.8 cm [9.8 in]
Width	32.8 cm [12.9 in]
Depth	71.4 cm [28.1 in]
Weight	35 kg [76 lb]

Part No.	Description
G5582AA/GA	Agilent Microplate Centrifuge



# Agilent BenchCel Microplate Handler

## Data Sheet



### Applications

1. Labeling and Sealing
2. Centrifugation
3. Replication
4. Screening and more...

### Introduction

The Agilent BenchCel Microplate Handler is a compact system that rivals full-size automation platforms. The BenchCel Microplate Handler R-Series (or BenchCel R-Series) is a masterpiece of form, function, and flexibility in laboratory automation. In a class by itself, this robust, versatile, high-speed, ultra-compact benchtop automation platform continues to earn accolades, year after year.

The BenchCel Microplate Handler is a combination of automated microplate handling and storage that delivers the speed and precision of a full-sized automation platform. The BenchCel Microplate Handler features a high-speed robot that can access integrated microplate stacks and peripheral instruments. This customizable, modular design provides the flexibility and scalability required to meet the needs of the most diverse laboratory applications. Adding to the BenchCel Microplate Handler's versatility, the delidding function removes and replaces microplate lids as necessary. The BenchCel Microplate Handler is available in 2, 4, or 6 stack configurations, with options for rack capacity and style. The BenchCel Microplate Handler can be powered by VWorks Automation Control Software. VWorks intelligent scheduling software features icon-based protocol editing with straightforward interfaces for integrated devices. VWorks includes a labware database capable of managing most labware, including standard microplates, filter plates, deep well microplates, tip boxes, and tube racks.



**Agilent Technologies**

## Features & Benefits

### System Features

- High speed 8 second transfer times from stack to instrument
- 2, 4, or 6, stack configurations for a maximum of 360 standard microplates
- Storage and handling of most microplates, lidded plates, tip boxes and tube racks
- 66% more walk-away time than competitive systems
- Integration of multiple instruments into a single benchtop workstation

### Benefits

- **Compact:** A benchtop platform with the speed and precision of a full-sized automated system.
- **Versatile:** Proven automated solutions for a range of simple and complex laboratory applications.
- **Easy to Use:** Powered by VWorks Automation Control Software for complete control that is easy to use for all levels of operators.

## Additional Information

### Application Details

**Labeling and Sealing:** Combine the BenchCel Microplate Handler with the Agilent Microplate Labeler and PlateLoc Sealer and label up to four sides of a microplate with a process time of 20 seconds. Seal, label, and stack over two microplates per minute.

**Centrifugation:** Combine the BenchCel Microplate Handler with the Agilent Microplate Centrifuge and have a walk-away solution for liquid leveling, liquid extraction and SPE. Users can spin 2 plates simultaneously and up to 360 microplates in a single run.

**Replication:** Combine multiple BenchCel units with the Bravo Liquid Handler, PlateLoc, Microplate Labeler and Microplate Centrifuge to create the most compact and versatile high-throughput benchtop microplate replication solution. 50 plates can be replicated into labeled and sealed daughter plates in one hour.

**Screening:** Integration of the versatile Bravo Liquid Handler or Vertical Pipetting Station with a variety of industry leading plate readers, washers, and incubators creates a compact benchtop solution for screening of enzymes, proteins, antibodies or cells. With VWorks Automation Control Software microplates can be processed simultaneously for the highest throughput. Additional accessories can be added to allow barcode tracking, temperature control, microplate shaking, and automated disposal of contaminated tips or labware to waste bins.

**Other Applications Include:** Bulk dispensing, plate reading, PCR setup and cleanup, CYP assays, SiRNA screening, cell based assays and more.

## Specifications

**Electrical:** U.S.: 100–240 ~, 50/60 Hz, Operating AC Current 5A/120V or 2.5A/240V (typical), Inrush Current 20A/120V or 40A/240V (typical)

**Environment:** 4–40 °C, 10–90% RH, non-condensing

**Air:** 34 Lpm at 6.5 bar [1.2 cfm at 95 psi]

**Software:** VWorks benchtop software (contact Sales or Technical Support for the most appropriate software for your application); ActiveX control

**Controller:** PC using Windows XP or Vista operating system

**Interface:** 10BaseT Ethernet port, RS-232 serial port

**Certification:** CE certified

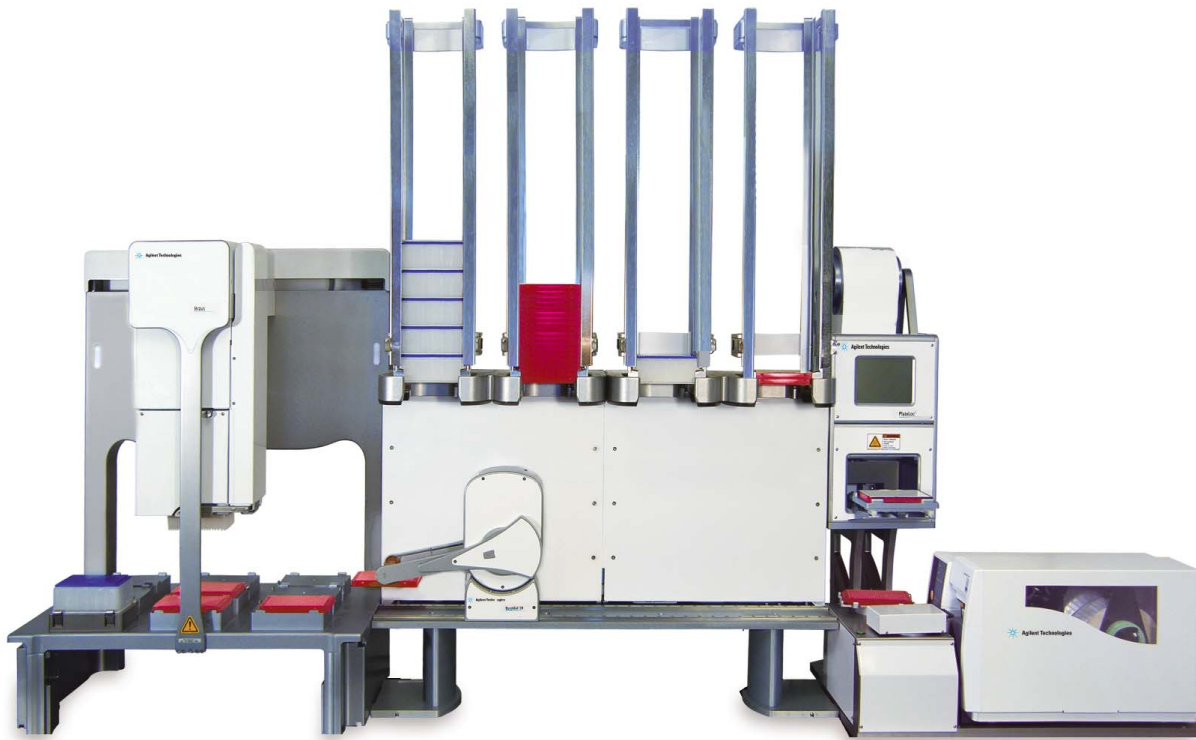
**Labware Compatibility Microplates:** ANSI-compliant microplates including PCR microplates, deep well microplates, filter microplates, and tube racks Tip boxes: All Automation Solutions tip boxes as well as other stackable third-party tip boxes

**Dimensions**

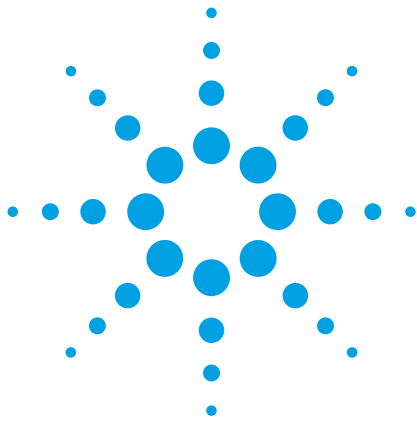
2 Stack Base Unit	4 Stack Base Unit	6 Stack Base Unit
Height: 45.1 cm [17.8 in]	Height: 45.1 cm [17.8 in]	Height: 45.1 cm [17.8 in]
Width: 43.0 cm [17.0 in]	Width: 86.0 cm [34.0 in]	Width: 130.0 cm [51.0 in]
Depth: 20.0 cm [8.0 in]	Depth: 20.0 cm [8.0 in]	Depth: 20.0 cm [8.0 in]
Weight: 21.8 kg [48 lbs]	Weight: 28.1 kg [55 lbs]	Weight: 32.7 kg [72 lbs]

Note: Height does not include rack height.

Part No.	Description
G5400A	Agilent BenchCel Microplate Handling Workstation – Integration with multiple instruments
G5410A	Agilent BenchCel Microplate Handler – Standalone Device



*Example solution for RNAi sample preparation composed of the BenchCel Microplate Handler integrated with the Bravo Liquid Handling platform, Microplate Labeler, and PlateLoc Microplate Sealer.*



# Agilent Labware MiniHub

## Data Sheet



### Applications

- Laboratory automation
- Genomic workflows and assays
- ELISA and cell-based assays
- Drug discovery
- High-throughput screening
- Compound management
- Secondary screening and ADMET assays
- Enzyme assays
- and more...

### Introduction

The Agilent Labware MiniHub is a rotating random-access device for presenting and storing SBS-format labware in laboratory automation systems. An efficient modular unit, the Labware MiniHub features user-configurable shelf spacing that easily accommodates a mix of microplates, tube racks, deep-well microplates, and pipette tip boxes while maintaining a compact footprint.

The Agilent Labware MiniHub is designed with your applications in mind. Small but flexible, and safer than other alternatives, the Labware MiniHub solves all your room-temperature storage needs.

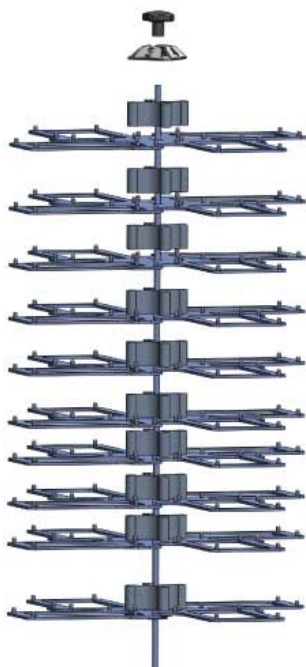
*Figure 1: Agilent Labware MiniHub models configured for mixed labware storage. Labware MiniHub for the Agilent BenchCel (G5471A) is shown on top, while the MiniHub model for systems is shown below (G5472A).*



### **Revolutionary flexibility**

Traditional storage devices use fixed-pitch racks (fixed height between shelves), permitting only one type of labware per carousel. To use a mix of labware types, you must employ different carousels, thus taking up valuable system real estate and limiting the choice of labware types on small storage devices.

A novel concept in labware storage, stackable spacers in the Agilent Labware MiniHub allow the height between shelves to be adjustable, thus permitting different labware types in the same carousel and easily creating multiple locations for storage of any given labware. Unique shelf design permits both portrait and landscape access for most robots. In addition, the size of cutouts in the shelves fits popular filter plates, preventing contamination issues.



*Figure 2: The revolutionary design permits configurable shelf spacing, accommodating labware of different heights.*

### **Technology**

#### **Remarkable performance with excellent positional accuracy**

The Labware MiniHub uses the same direct-drive technology that is employed by the Agilent Direct Drive Robot (DDR) to offer the best reliability with the highest levels of safety. With infinite bi-directional rotation, the Labware MiniHub never needs to unwind and always takes the shortest route to its target position. With a brushless motor and the bearing as the only moving parts, the mechanical design is simple, efficient and maintenance-free, thus ensuring high levels of dependability and a reduced cost of ownership. Positional accuracy is guaranteed by combining a high resolution optical encoder with the stepper motor.

#### **Safety and crash recovery**

The Labware MiniHub use of direct drive reduces the drive inertia and enables smooth accelerations and a continuous force feedback loop at all times. Rounded edges on all surfaces, the avoidance of any major pinch point, and a maximum linear speed below 250 mm/s increase the overall safety of the Labware MiniHub. In the unlikely event of a crash or interference, the motors will immediately stop. After removing the obstacle, the Agilent VWorks Automation Control software will permit continuation of the previous action in the protocol.



*Figure 3: Cutouts in the shelves are suitable for holding filter plates.*

### **Software control**

The Labware MiniHub is easily controlled using VWorks Automation Control software or third-party automation software through the available ActiveX interface. Both options will give the user access to the diagnostics interface to easily set up and teach the Labware MiniHub.

### **Features & Benefits**

- Easy re-configuration without tools or additional hardware
  - Unique 4-position shelves accommodates all SBS-footprint labware
  - Stackable 25.1 mm spacers permits different labware heights
- Performance
  - Plate presentation time is < 5 seconds
  - Automatically uses shortest route to target position (90° or 180° turns)
- Ultra-compact design
- Labware presentation in portrait or landscape orientation
- Designed with safety in mind
  - Direct drive for minimal inertia
  - Collision/resistance sensing and automatic emergency stop
  - Rounded edges to prevent puncture or other injuries
- Reliable and precise state-of-the-art direct drive technology
  - Fewer moving parts, higher reliability
  - Smooth acceleration/deceleration
  - Adjustable acceleration for safe liquid handling

## Specifications

**Transfer time:** < 5 seconds for longest turn

**Payload:**

Per labware: 200 g  
Maximum: 12 800 g

**Repeatability:**  $\pm 0.02^\circ$  Phi ( $\pm 0.5$  mm)

**Exclusion zone:** 33 x 500 cm cylinder above the base

**Labware compatibility:** Supports SBS footprint labware (microplates, deep-well microplates, tube and vial racks, tip boxes), and some common filter plates

**Weight:**

G5471A: 10 kg  
G5472A: 13 kg  
G5473A: 3.6 kg

**Mounting pattern:** Four M5 x 60 (G5550-02377) through holes on 188 mm bolt modifies pattern, or using two M6 x 25 screws (G5550-02412) using the sliding brackets under white cover plates

**Operating environment:** 4-40°C, 20-90% RH non-condensing

**Computer connection:** RS-232 or DB9 serial port

Table 1: Regulatory compliance certification

Regulatory Compliance	Standard
<b>EMC</b>	
European Union	EMC Directive 2004/108/EC IEC 61326-1:2005 / EN 61326-1:2006
Canada	ICES/NMB-001:2004
Australia/New Zealand	AS/NZS CISPR 11:2004
<b>Safety</b>	
European Union	Machinery Directive 2006/42/EC Low Voltage Directive 2006/95/EC IEC 61010-1:2001 / EN61010-1:2001
Canada	CAN/CSA-C22.2 No. 61010-1-04
USA	ANSI/UL 61010-1:2004

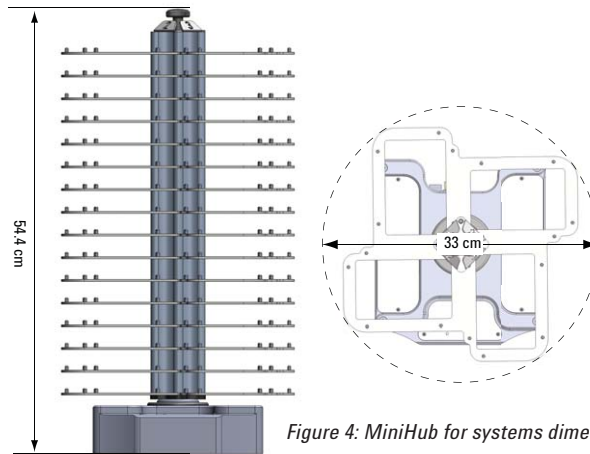


Figure 4: MiniHub for systems dimensions.

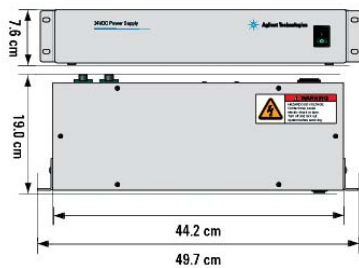


Figure 6: 24VDC Power Supply includes rack-mounting brackets.

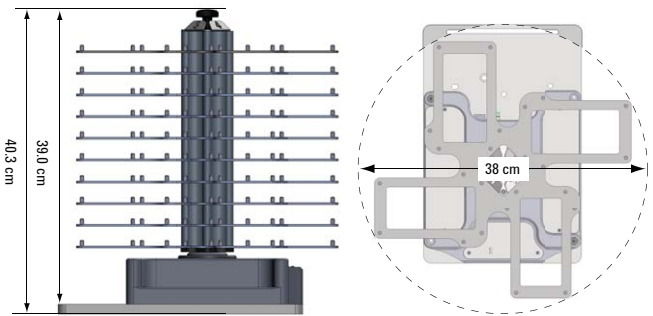


Figure 5: MiniHub for Agilent BenchCel dimensions.

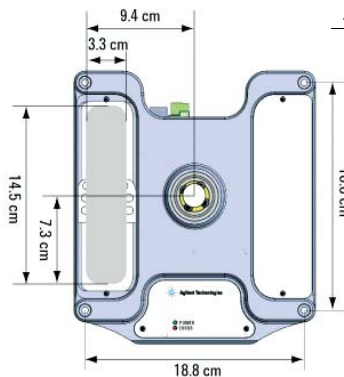


Figure 7: MiniHub base layout. Mount using the four corner M5 x 60 screws or two M6 x 25 using the sliding brackets under the cover plates.



## Ordering Information

**Two models of the Agilent Labware MiniHub are available:**

**G5471A (Systems model)** was designed to be integrated in laboratory automation systems driven by a robot with extended vertical reach such as the Agilent DDR. Labware can be accessed in either portrait or landscape orientation. The Labware MiniHub includes 16 shelves to accommodate a maximum of 64 microplates (14 mm SBS format for a 25.1 mm pitch). A maximum of 18 tip boxes can be accommodated with seven shelves and triple spacing (75.3 mm pitch). This system has the smallest footprint with just a 33 cm diameter.

**G5472A (BenchCel model)** is ready for integration with the Agilent BenchCel Microplate Handler in laboratory workstations. The Labware MiniHub can be placed on either side of the BenchCel Handler and labware is accessed in the portrait orientation. It includes 10 shelves to accommodate a maximum of 40 microplates (14 mm SBS format for a 25.1 mm pitch) or 16 tip boxes with triple spacing (75.3 mm pitch).



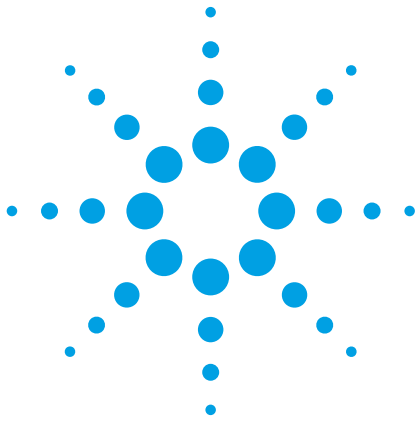
Figure 8: BenchCel robot picking up microplate from the Agilent Labware MiniHub.

## G5473A – 24VDC Power Supply.

Included with both Labware MiniHub configurations, the power supply can power two Labware MiniHubs or two Agilent Microplate Exchangers. The general purpose laboratory 24 V power supply is able to deliver up to 175 W of continuous power to two devices. It features rack-mounting brackets for convenient setup on an Agilent BioCel System or other automation systems.

Table 2: Ordering information for spare parts

Part name	Part number
<b>Shelves</b>	
G5471A System model (16)	G5508-10000
G5472A BenchCel model (10)	G5400-00007
Spacer	G5508-20009
<b>Rod</b>	
46.6 cm (for the system model)	G5508-20012
30.0 cm (for the BenchCel model)	G5508-20013
Standard integration plate (BenchCel model only)	G5400-20029
<b>Fuses</b>	
4 A	5188-8316
12 A	5188-8347



# Agilent Labware Stacker

## Data Sheet



### Applications

1. Small footprint for space-limited labs
2. Ultra-compact storage and dispensing of tip boxes
3. Pin tools or up to 60 ANSI-compliant microplates
4. Automated systems using articulated arm robots

### Introduction

The Agilent Labware Stacker makes storing and dispensing microplates fast and easy. The Labware Stacker is a sophisticated device for dispensing and receiving microplates from robotic systems. An efficient modular unit, the Labware Stacker provides the compact size and speed demanded in today's automated systems. The Labware Stacker features removable racks for convenient access to microplates. Its versatile design accommodates all types of microplates (including deep well microplates) as well as pipette tip boxes and pin tools. The Labware Stacker's compact size allows for multiple stackers to be used in your system, increasing the speed and efficiency of your automated protocols.



**Agilent Technologies**

## Features & Benefits

### System Features

- **Standard Rack**  
Standard rack design allows convenient operator access for loading and unloading microplates. Top-load and front-load racks available in various sizes (contact Agilent).
- Deep well blocks are compatible with the Labware Stacker.
- Racks can also accommodate pipette tip boxes, pin tools, and filter microplates.
- **User Interface**  
The Labware Stacker is intended to be routinely used for automated runs controlled by platform software. If you are using the Agilent BioCel System, the platform software is Agilent VWorks Automation Control software. If you are running the Labware Stacker in a system developed by your own organization, the platform software will need to be custom written using a program such as C++ or Visual Basic and Agilent's ActiveX software.
- **Rack Capacity**  
The following is a table of basic microplate types and their capacity in the Labware Stacker rack. This is a general guideline only. For rack capacity for specific microplate types, contact Agilent.

Microplate Type	Standard Rack Capacity
Assay (without lid)	50
Assay (with lid)	42
Thermal cycling (no seal)	88
Tip box	11
Deep well (2.2 mL)	15
Deep well (1.2 mL)	24

For additional detailed information on labware racks, please see **Agilent Labware Racks**, PUB 5990-4089EN.

### Benefits

- **Small Footprint**  
Compact size allows for multiple stackers, increasing speed and efficiency.
- **Smart Design**  
Automatically checks for correct microplate type and orientation.
- Variety of Storage Racks
- Accommodates racks of different sizes and styles.

### Specifications

**Electrical:** 100-240 VAC, 50/60 Hz, Operating AC Current 1.2A/120V or 72A/240V (typical), Inrush Current 20A/120V or 40A/240V (typical)

**Operating Temperature:** 4–40 °C; 10–90% RH, non-condensing

**Air:** 28 Lpm at 5.5 bar (<1 cfm at 80 psi)

**Software:** Includes ActiveX Control CD

**Interface:** RS-232 serial port with DB9 pin connector

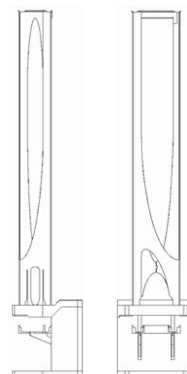
**Rack Dimensions:** W 3.5 in x D 5.25 in x H 26.75 in (Standard Rack)

**Certification:** CE certified and built to meet UL standards

## Dimensions

Width: 20.3 cm [8 in]  
Depth: 22 cm [8.5 in]  
Height: 19 cm [7.5 in]  
Weight: 6.1 kg [13.5 lbs]

Note: Height does not include rack height.



Part No.	Description
G5407A	<b>Labware Stacker, Standard</b>
G5407A Option 60	Standard Rack; 860mm
G5407A Option 61	Top Loading Rack; 250mm
G5407A Option 62	Top Loading Rack; 460mm
G5407A Option 63	Top Loading Rack; 660mm
G5407A Option 64	Top Loading Rack; 860mm
G5407A Option 65	Front Loading Rack; 250mm
G5407A Option 66	Front Loading Rack; 460mm
G5407A Option 67	Front Loading Rack; 660mm
G5407A Option 68	Microtube Rack; 660mm

# Agilent AssayMAP Bravo Cartridges for Automated Protein Sample Preparation Workflows



## Introduction

The Agilent AssayMAP platform is a powerful yet easy-to-use automation solution specifically designed for biomolecule sample preparation. AssayMAP microchromatography cartridges combined with optimized protocols enable non-automation experts to use automation to increase precision and scalability while at the same time decreasing the labor and human error so you have more confidence in your results and more time to analyze your biomolecule. The AssayMAP platform supports a broad range of protein quantification and characterization workflows including affinity purification, enzymatic digestion, protein and peptide cleanup, peptide mapping, peptide fractionation, N-Glycan analysis, and phosphopeptide enrichment.

## Cartridge types

Product	Application	Resin Bed Volume	
		5 µL	25 µL
C18	Desalting mixtures of peptides and small proteins prior to analysis by mass spectrometry.	5190-6532	G5496-60017
Fe(III)-NTA	Phosphopeptide enrichment prior to analysis by mass spectrometry.	G5496-60085	–
Protein A (PA-W)	Purification of monoclonal and polyclonal antibodies and Fc fusion proteins with affinity for Protein A.	G5496-60000	G5496-60018
Protein G (PG-W)	Purification of monoclonal and polyclonal antibodies and Fc fusion proteins with affinity for Protein G.	G5496-60008	–
Resin-Free	Placeholder when working with sample numbers that are not a multiple of eight.	G5496-60009	–
Reversed Phase (RP-S)	Desalting or fractionating mixtures of peptides and small proteins prior to analysis by mass spectrometry.	G5496-60033	G5496-60023
Reverse Phase (RP-W)	Desalting of denatured proteins (antibodies) prior to trypsin digestion.	G5496-60086	–
Streptavidin (SA-W)	Generation of affinity cartridges by immobilizing biotinylated molecules. Affinity cartridges can subsequently be used to purify target molecules from complex matrices.	G5496-60010	G5496-60021
Strong Cation Exchange (SCX)	Fractionating mixtures of peptides and small proteins prior to analysis by mass spectrometry.	5190-6536	–
TiO2	Phosphopeptide enrichment prior to analysis by mass spectrometry.	G5496-60016	–

## Starter kits (including cartridges and required labware)

Product	Description	Application	Catalog Number
AssayMAP Digestion and C18 Cleanup Starter Kit	1 rack of C18 cartridges plus labware for digestion and cleanup protocols	Protein digestion and subsequent peptide cleanup prior to analysis by mass spectrometry.	G5496-60013
AssayMAP Digestion and RP-S Cleanup Starter Kit	1 rack of RP-S cartridges plus labware for digestion and cleanup protocols	Protein digestion and subsequent peptide cleanup prior to analysis by mass spectrometry.	G5496-60034
AssayMAP SCX Fractionation Starter Kit	1 rack of SCX cartridges plus labware for digestion and cleanup protocols	Protein digestion and subsequent peptide fractionation prior to analysis by mass spectrometry.	G5496-60014

## Supplemental items

Product	Description	Application	Catalog Number
Syringe Test Kit	96 resin free cartridges (1 rack plus enough syringe test solution to perform 20 tests)	Routine verification that all 96 the AssayMAP syringes.	G5496-60050
Syringe Replacement Kit	10 replacement syringes plus the tools required to replace faulty syringes.	Allows customers to replace the syringes on site to avoid costly down time.	G5409-68002
AssayMAP Syringes	10 AssayMAP syringes	AssayMAP syringes for use with the syringe replacement kit.	G5496-60007
Bravo Plate Risers	1 Plate Riser	Accessory Required for normalization, serial dilution, and reformatting utilities.	G5498B#061
Bravo Closed Corner Plate Pad	Plate pad designed to minimize the risk of plate misalignment.	Alternative for standard Bravo plate pads.	G5498B#125
PCR Plate Thermal Insert	Thermal insert for the Peltier heater/cooler to improve heat transfer to the plate wells.	For In-Solution Digestion Single plate and On-Cartridge Reaction applications.	G5498B#013
96 well Greiner U,V-Bottom Plate Thermal Insert	Thermal insert for the Peltier heater/cooler to improve heat transfer to the plate wells.	For In-Solution Digestion Single plate and On-Cartridge Reaction applications.	G5498B#126
96 well Abgene Deep Well Plate Thermal Insert	Thermal insert for the Peltier heater/cooler to improve heat transfer to the plate wells.	For In-Solution Digestion Single plate and On-Cartridge Reaction applications.	G5498B#127
Wide-Bore Chimneys	100 pack wide-bore chimneys	25 µL cartridges require wash station to be equipped with wide-bore chimneys*	G5409-68004

## Additional cartridge details

Cartridge	
<b>C18 5 µL</b>	
Part Number	5190-6532
Bead Type	Silica (20 µm diameter)
Pore Size	150 Å
Surface Chemistry	C18 (reversed-phase)
Dynamic Binding Capacity	400 µg of human insulin (≤10% breakthrough when loading up to 400 µg of human insulin per cartridge) Approximately 150 to 200 µg of digested BSA (loading more than 150 µg of digested BSA results in loss of very hydrophilic peptides)
Saturation Binding Capacity	Approximately 450 µg of human insulin
Storage Temperature	Room temperature
pH Stability	2 to 7 for routine use
<b>C18 25 µL</b>	
Part Number	G5496-60017
Bead Type	Silica (20 µm diameter)
Pore Size	150 Å
Surface Chemistry	C18 (reversed-phase)
Dynamic Binding Capacity	1,800 µg of human insulin (≤10% breakthrough when loading up to 1,800 µg of human insulin per cartridge) Approximately 700 to 900 µg of digested BSA (loading more than 700 µg of digested BSA results in loss of very hydrophilic peptides)
Saturation Binding Capacity	Approximately 2,000 µg of human insulin
Storage Temperature	Room temperature
pH Stability	2 to 7 for routine use
<b>Fe(III)-NTA</b>	
Part Number	G5496-60085
Bead Type	Synthetic Polymer (50 µm diameter)
Pore Size	Large enough for large biomolecules
Surface Chemistry	Fe(III) chelated to nitrilotriacetic acid
Dynamic Binding Capacity	20 µg of adenosine monophosphate (≥ 90% recovery when 20 µg of adenosine monophosphate is loaded per cartridge) Up to approximately 800 µg of digested yeast extract can be loaded per cartridge with minimal phosphopeptide breakthrough
Saturation Binding Capacity	Approximately 25 µg of adenosine monophosphate
Storage Temperature	Room temperature
pH Stability	2 to 11 (cartridge will turn more yellow/gold with increasing pH)
<b>PA-W 5 µL</b>	
Part Number	G5496-60000
Bead Type	Synthetic polymer (53 to 61 µm diameter)
Pore Size	Large enough for large biomolecules such as antibodies
Surface Chemistry	Recombinant Protein A
Dynamic Binding Capacity	100 µg of human IgG1 (≤10% breakthrough when loading up to 100 µg of human IgG1 per cartridge)
Saturation Binding Capacity	Approximately 125 µg of hIgG1
Storage Temperature	Room temperature
pH Stability	6 to 8 for routine use, 3 to 11 for short exposure
<b>PA-W 25 µL</b>	
Part Number	G5496-60018
Bead Type	Synthetic polymer (53 to 61 µm diameter)
Pore Size	Large enough for large biomolecules such as antibodies
Surface Chemistry	Recombinant Protein A
Dynamic Binding Capacity	800 µg of human IgG1 (10% breakthrough when loading up to 800 µg of human IgG1 per cartridge)
Saturation Binding Capacity	Approximately 1,000 µg of hIgG1
Storage Temperature	Room temperature
pH Stability	6 to 8 for routine use, 3 to 11 for short exposure

PG-W	
Part Number	G5496-60008
Bead Type	Synthetic polymer (45 to 53 µm diameter)
Pore Size	Large enough for large biomolecules such as antibodies
Surface Chemistry	Recombinant Protein G
Dynamic Binding Capacity	100 µg human IgG (≤10% breakthrough when loading up to 100 µg of human IgG per cartridge)
Saturation Binding Capacity	Approximately 150 µg of IgG
Storage Temperature	Room temperature
pH Stability	6 to 8 for routine use, 3 to 11 for short exposure
Resin Free	
Part Number	G5496-60009
Bead Type	NA
Pore Size	NA
Surface Chemistry	NA
Dynamic Binding Capacity	NA
Saturation Binding Capacity	NA
Storage Temperature	Room temperature
pH Stability	NA
RP-S 5 µL	
Part Number	G5496-60033
Bead Type	Synthetic polymer (15 to 20 µm diameter)
Pore Size	100 Å
Surface Chemistry	Underivatized polystyrene-divinylbenzene (reversed-phase)
Dynamic Binding Capacity	400 µg of human insulin (≤10% breakthrough when loading up to 400 µg of human insulin per cartridge) Approximately 150 to 200 µg of digested BSA (loading more than 150 µg of digested BSA results in loss of very hydrophilic peptides)
Saturation Binding Capacity	Approximately 500 µg of human insulin
Storage Temperature	Room temperature
pH Stability	1 to 14
RP-S 25 µL	
Part Number	G5496-60023
Bead Type	Synthetic polymer (15 to 20 µm diameter)
Pore Size	100 Å
Surface Chemistry	Underivatized polystyrene-divinylbenzene (reversed-phase)
Dynamic Binding Capacity	2,300 µg of human insulin (≤10% breakthrough when loading up to 2,200 µg of human insulin per cartridge) Approximately 850 to 1,100 µg of digested BSA (loading more than 850 µg of digested BSA results in loss of very hydrophilic peptides)
Saturation Binding Capacity	Approximately 2,300 µg of human insulin
Storage Temperature	Room temperature
pH Stability	1 to 14
RP-W	
Part Number	G5496-60086
Bead Type	Synthetic polymer (30 µm diameter)
Pore Size	Large enough for large biomolecules such as antibodies
Surface Chemistry	Underivatized polystyrene-divinylbenzene (reversed-phase)
Dynamic Binding Capacity	75 µg of denatured human IgG1 (≤10% breakthrough when loading up to 75 µg of denatured human IgG1 per cartridge)
Saturation Binding Capacity	Approximately 90 µg of denatured human IgG1
Storage Temperature	Room temperature
pH Stability	1 to 14

SA-W 5 µL	
Part Number	G5496-60010
Bead Type	Synthetic polymer (45 to 53 µm diameter)
Pore Size	Large enough for large biomolecules such as antibodies
Surface Chemistry	Recombinant Streptavidin
Dynamic Binding Capacity	50 µg of biotinylated BSA (≤10% breakthrough when loading up to 50 µg of biotinylated BSA per cartridge) Approximately 90 µg of biotinylated IgG
Saturation Binding Capacity	Approximately 60 µg of biotinylated BSA Approximately 100 µg of biotinylated IgG
Storage Temperature	4 to 10 °C
pH Stability	6 to 8 for routine use, 3 to 11 for short exposure
SA-W 25 µL	
Part Number	G5496-60021
Bead Type	Synthetic polymer (45 to 53 µm diameter)
Pore Size	Large enough for large biomolecules such as antibodies
Surface Chemistry	Recombinant Streptavidin
Dynamic Binding Capacity	350 µg of biotinylated BSA (≤10% breakthrough when loading up to 350 µg biotinylated BSA per cartridge)
Saturation Binding Capacity	Approximately 450 µg of biotinylated BSA
Storage Temperature	4 to 10 °C
pH Stability	6 to 8 for routine use, 3 to 11 for short exposure
SCX	
Part Number	5190-6536
Bead Type	Silica (20 µm diameter)
Pore Size	300 Å
Surface Chemistry	Polysulfoethyl A (strong cation exchange)
Dynamic Binding Capacity	800 µg of human insulin (≤10% breakthrough when loading up to 800 µg of human insulin per cartridge) Approximately 400 to 500 µg of digested BSA
Saturation Binding Capacity	Approximately 1,000 µg human insulin
Storage Temperature	Room temperature
pH Stability	2 to 7 for routine use
TiO <sub>2</sub>	
Part Number	G5496-60016
Bead Type	Ceramic titanium dioxide (20 µm diameter)
Pore Size	100 Å
Surface Chemistry	Titanium dioxide
Dynamic Binding Capacity	80 µg of phenyl phosphate (≥ 90% recovery when 80 µg of phenyl phosphate is loaded per cartridge) Up to approximately 1,000 µg of digested α-casein can be loaded per cartridge with minimal phosphopeptide breakthrough
Saturation Binding Capacity	Approximately 115 µg of phenyl phosphate
Storage Temperature	Room temperature
pH Stability	1 to 14



# The Best Tips for Your Best Results

Agilent Automation Solutions consumables: pipette tips



## Tools that deliver confidence in measurement

Agilent Certified Pipette Tips, working together with Agilent automation instruments, function reliably and predictably in all your experiments.

**They have been designed and are validated to provide:**

- Optimal performance
- Accurate results
- Maximum uptime

In combination with our comprehensive application, technical, and hardware support, Agilent offers the highest quality automation solutions available.










Agilent Bravo Liquid Handlers and Certified Pipette Tips work together to deliver optimal performance.

## Why use Agilent Pipette Tips?

Automation workflows require the use of high quality pipette tips to ensure consistency and accuracy within an experiment. Ultimately, inaccurate pipetting can cause experimental errors such as missed targets. We highly recommend the use of only Agilent Pipette Tips on the Bravo platform to ensure consistent results. Agilent's proprietary tips undergo complete QC and functional performance testing for each lot that is produced ensuring consistency and reproducibility in your workflow.

## Superior performance comes from superior quality

Agilent Pipette Tips are manufactured in a tightly controlled environment (ISO 9001 registered and audited) and are subjected to rigorous testing procedures and to meet performance standards. The complete list of all QC tests that are performed for each lot of our pipette tips are:

-  Certified free to detectable DNase and RNase nuclease activity
-  Certified free of endotoxin (pyrogen) contamination
-  Certified free of adenosine triphosphate (ATP)
-  Certified free of human DNA
-  Certified free of protease activity
-  Certified free of heavy metals
-  Certified as sterile with a sterility assurance level (SAL) of  $10^{-6}$

## Boost productivity and improve results

Agilent Pipette Tips are available in a wide range of sizes and configurations in order to meet a variety of experimental needs. They are created with innovative processing and packaging that reduce static buildup and improve deck space utilization. Regardless of your application, you can be sure that Agilent offers pipette tips or rack configurations specifically designed for your requirements and all the Bravo heads.

Select the best Agilent Pipette Tips and rack configurations for your application.

### Sterile tips

Agilent Sterile Pipette Tips are designed for sensitive biological applications, such as working with cells, DNA, or RNA. They have been irradiated and packaged to prevent contamination.



Sterile pipette tip rack packaging.

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### Filtered tips

Agilent Filtered Pipette Tips are recommended for PCR, NGS, cell biology, and molecular biology applications. They create an effective barrier by using an integrated filter that protects the pipette shaft from aerosols and liquid contaminants. In addition, they significantly reduce errors caused by carryover contamination between microplate wells.



Filtered tips are available in several sizes.

## Wide bore

Agilent Wide Bore Pipette Tips are specifically designed for transferring viscous liquids, fragile cells, DNA, and samples containing large particles or beads. These pipette tips have an orifice that is larger than a standard tip of the same volume.

Agilent Pipette Tip Orifice Comparison	
Pipette Tip	Orifice Diameter
70 $\mu$ L Standard	0.36 mm (0.014 in)
70 $\mu$ L Wide Bore	0.78 mm (0.031 in)
250 $\mu$ L Standard	0.61 mm (0.024 in)
250 $\mu$ L Wide Bore	1.52 mm (0.060 in)

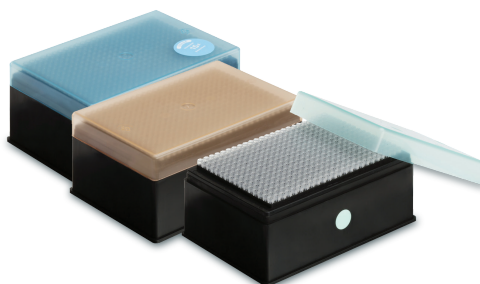


Comparison between a standard 250  $\mu$ L tip with 0.61 mm (0.024 in) opening (upper) and a wide bore tip with a 1.52 mm (0.060 in) opening (lower).

## Conductive racks

All pipette tips are susceptible to a static charge resulting from friction encountered during packaging, shipping, or storage in laboratory hotel racks. Tips may be repelled or attracted to surrounding materials, such as the rack above or below. This can lead to a missed tip during pipetting, or a tip mounted at an angle that interferes with liquid dispensing or collection, potentially causing the pipette head to crash.

Agilent's conductive racks include a resin that alleviates the buildup of static charge, delivering reliable results and worry-free walkaway time.



Agilent conductive racks include a resin that alleviates the buildup of static charge.

## Nested tips
















Agilent nested pipette tip rack configurations reduce waste and increase free deck space by allowing up to three times as many tips to be stored on the deck and in stacker racks. These pipette racks are shorter and lack lids to reduce plastic waste, an important consideration when handling hazardous materials.















All nested tips are packaged in conductive tip racks to reduce static charge buildup.

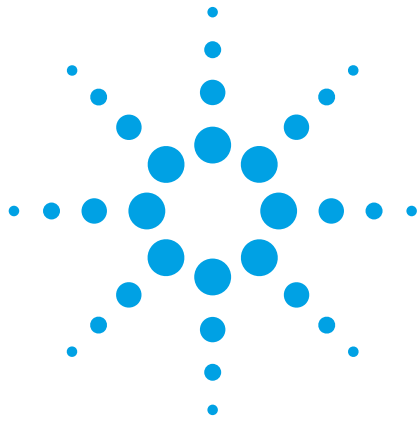


Fifteen nested pipette-tip racks require the same amount of space as five standard pipette-tip racks for the same size tips.

# Agilent Automation Solutions pipette tip selection guide

	Description	Part Number	Volume Range (µL)	Bravo Head	Microplate Access
	<b>Agilent 10 µL Pipette Tip Racks</b>				
	10 µL Tips, 384 in rack, case of 50	10734-202	0.3 to 10	96ST, 384ST	96, 384, 1536
	10 µL Tips, Sterile, 384 in rack, case of 50	10734-212	0.3 to 10	96ST, 384ST	96, 384, 1536
	10 µL Tips, Conductive, 384 in rack, case of 50	10734-302	0.3 to 10	96ST, 384ST	96, 384, 1536
	10 µL Tips, Nested, Conductive, 384 in rack, case of 90	21740-202	0.3 to 10	96ST, 384ST	96, 384, 1536
	10 µL Tips, Sterile, Conductive, 384 in rack, case of 50	10734-312	0.3 to 10	96ST, 384ST	96, 384, 1536
	10 µL Tips, Nested, Sterile, Conductive, 384 in rack, case of 90	21740-212	0.3 to 10	96ST, 384ST	96, 384, 1536
	<b>Agilent 30 µL Pipette Tip Racks</b>				
	30 µL Tips, 384 in rack, case of 50	11484-202	0.5 to 30	96ST, 384ST	96, 384, 1536
	30 µL Tips, Sterile, 384 in rack, case of 50	11484-212	0.5 to 30	96ST, 384ST	96, 384, 1536
	30 µL Tips, Conductive, 384 in rack, case of 50	11484-302	0.5 to 30	96ST, 384ST	96, 384, 1536
	30 µL Tips, Nested, Conductive, 384 in rack, case of 90	21750-202	0.5 to 30	96ST, 384ST	96, 384, 1536
	30 µL Tips, Sterile, Conductive, 384 in rack, case of 50	11484-312	0.5 to 30	96ST, 384ST	96, 384, 1536
	30 µL Tips, Nested, Sterile, Conductive, 384 in rack, case of 90	21750-212	0.5 to 30	96ST, 384ST	96, 384, 1536
	30 µL Tips, Sterile, Filtered, Conductive, 384 in rack, case of 50	11484-322	0.5 to 15	96ST, 384ST	96, 384, 1536

	Description	Part Number	Volume Range (µL)	Bravo Head	Microplate Access
	<b>Agilent 70 µL Pipette Tip Racks</b>				
	70 µL Tips, 384 in rack, case of 50	19133-102	0.75 to 70	96ST, 384ST	96, 384
	70 µL Tips, Sterile, 384 in rack, case of 50	19133-112	0.75 to 70	96ST, 384ST	96, 384
	70 µL Tips, Conductive, 384 in rack, case of 50	19133-202	0.75 to 70	96ST, 384ST	96, 384
	70 µL Tips, Sterile, Conductive, 384 in rack, case of 50	19133-212	0.75 to 70	96ST, 384ST	96, 384
	70 µL Tips, Sterile, Filtered, Conductive, 384 in rack, case of 50	19133-142	0.75 to 50	96ST, 384ST	96, 384
	70 µL Tips, Wide Bore, Sterile, Conductive, 384 in rack, case of 50	19134-012	2.0 to 70	96ST, 384ST	96 only
	70 µL Tips, Wide Bore, Conductive, 384 in rack, case of 50	19134-002	2.0 to 70	96ST, 384ST	96 only
	70 µL Tips, Wide Bore, Filtered, Sterile, Conductive, 384 in rack, case of 50	19134-022	2.0 to 50	96ST, 384ST	96 only
	<b>Agilent 250 µL Pipette Tip Racks</b>				
	250 µL Tips, 96 in rack, case of 50	19477-002 or G8250A	2.0 to 250	96LT	96, 384
	250 µL Tips, Sterile, 96 in rack, case of 50	19477-012 or G8251A	2.0 to 250	96LT	96, 384
	250 µL Tips, Filtered, Sterile, 96 in rack, case of 50	19477-022 or G8252A	2.0 to 180	96LT	96, 384
	250 µL Tips, Wide Bore, 96 in rack, case of 50	19477-032	5.0 to 250	96LT	96 only
	250 µL Tips, Wide Bore, Sterile, 96 in rack, case of 50	19477-072	5.0 to 250	96LT	96 only
	250 µL Tips, Wide Bore, Filtered, Sterile, 96 in rack, case of 50	19477-082	5.0 to 180	96LT	96 only



# Agilent G5404A, G5404B/G Microplate Labeler Consumables

## Selection Guide



Authentic Agilent automation-certified labels with application-matched ribbon guarantee the highest level of system performance and superior instrument and applications support

*Instrument discontinued, consumables will remain available under new part number G5404-00029*



● = YES (dot)

### G5404A Microplate Labeler (formerly "VCode")

### G5404B/G Microplate Labeler

MEDIA KIT PRODUCT NUMBER	G5404-60029 5,000 Labels (formerly G5450A Option 001: 09479-001, 09479.001)	G5404-60005 6,500 Labels G5404-60013 13,000 Labels
Media Kit Contents:		
1-Label roll adhesive labels		
1-Ribbon roll to image one label roll		
1-Used ribbon take-up spool for take-up hub		
1-Print head cleaning pen (multi-use)		
1-Media loading document (G5404B labeler only)		
	<b>Discontinued:</b> <i>10,000 and 15,000 roll labels will no longer be available once existing supplies are exhausted:</i> G5450A Option 002 10,000 Labels (formerly 09479-002, 09479.002) G5450A Option 003 15,000 Labels (formerly 09479-003, 09479.003)	New Microplate Labeler instruments include one 6,500 label Media Kit. Additional consumables may be purchased at time of instrument purchase using these special part numbers: <b>G5404B/G Microplate Labeler Instrument (Standalone)</b> G5404B/G with Option 264 6,500 Labels G5404B/G with Option 267 13,000 Labels
<b>DESCRIPTION</b>	G5404A Labeler Media Kit 0.25" 5K Ribbon & labels for 5,000 labels. DMSO resistant, -80°C to +100°C. 6.35 mm H x 50.8 mm W. 0.25" High x 2" Wide. Compatible w/06497-001, 0.25" Vac Pads	G5404B/G Labeler Media Kit 0.25" 6.5K (or 13K) Ribbon & labels for 6,500 (or 13,000) labels. DMSO resistant, -80°C to +100°C. 6.35 mm H x 50.8 mm W. 0.25" High x 2" Wide. Compatible w/06497-001, 0.25" Vac Pads



**Agilent Technologies**



●= YES (dot)

**G5404A Microplate Labeler**

**G5404B/G Microplate Labeler**

**ROLL LENGTH** (Label Quantity)

5,000	●	
6,500		●
10,000		
13,000		●
15,000		

**ADHESION** (The type of adhesive used to adhere label) \* Permanent Adhesion: Adhesive strength increases over time. Label may be peeled-off but should not be reapplied. Label is designed to not fall off or come off, without some mechanical effort.

Removable		
Permanent	●*	●*

**APPLICATIONS** (Typical)

Compound Storage	●	●
DNA Sequencing	●	●
PCR Thermal Cycling (Dry)	●	●
PCR Water Bath Cycling	Limited – Must be Tested/Qualified	Limited – Must be Tested/Qualified
Screening	●	●
SPA Radioactive/Top Count Assays	●	●

**CHEMICAL COMPATIBILITY GUIDELINES** Dots in the fields below indicate that the image on the label has some level of chemical resistance (image remains legible on the label stock, by resisting damage by chemical reactivity or solvent action over short periods of time). For example, in the case of DMSO below, the image is considered resistant to DMSO rather than compatible or impervious to DMSO (the image may become illegible if concentrated DMSO is left on the image for extended periods or if DMSO is placed on a wipe, then rubbed over the image).

Water	●	●
DMSO	●	●
IPA	●	●

**DIMENSIONS**

Label, Individual	6.35 mm x 50.8 mm (0.25" High x 2.0" Wide)	6.35 mm x 50.8 mm (0.25" High x 2.0" Wide)
Label Thickness, Individual	0.06604 mm (0.0026") nominal	0.10668 mm (0.0042") nominal
Core Diameter (Label Core)	76.2 mm (3") ID	76.2 mm (3") ID

**MICROPLATE COMPATIBILITY** (Substrate compatibility – compatible with most plasticized surfaces)

Substrate (Most plasticized surfaces)	●	●
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**OPTICAL PROPERTIES** (Label Stock)

Opaque	●	●
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**PHYSICAL PROPERTIES**

Label Adhesion, Permanent (see section on adhesion)	●	●
Label Appearance White Glossy	●	
Label Appearance White Matte		●
Label, Polypropylene	●	●
Label Stock Liner (Backing)	Coated paper	Clear Synthetic
Cores (Labels and Ribbon)	Fiber	Plastic

●= YES (dot)

**G5404A Microplate Labeler**

**G5404B/G Microplate Labeler**

**THERMAL PROPERTIES** (Refers to the service or operating temperature range in which the label remains adhered to the substrate. This is highly application dependent and must be verified for each application.) \*\* Service Temperature Range data supplied by customers involved in applications such as compound storage and PCR.

Service Temperature Range	-80°C to +100°C (-112°F to +212°F) **	-80°C to +100°C (-112°F to +212°F) **
Minimum Application Temp	2°C (+35°F)	2°C (+35°F)

**STORAGE INFORMATION** (Refers to label/ribbon stock)

Conditions	Store out of direct sunlight, 16°C to 27°C (60°F to 80°F)	Store out of direct sunlight, 16°C to 27°C (60°F to 80°F)
Shelf Life (Best if Used by Date)	1 year	1 year

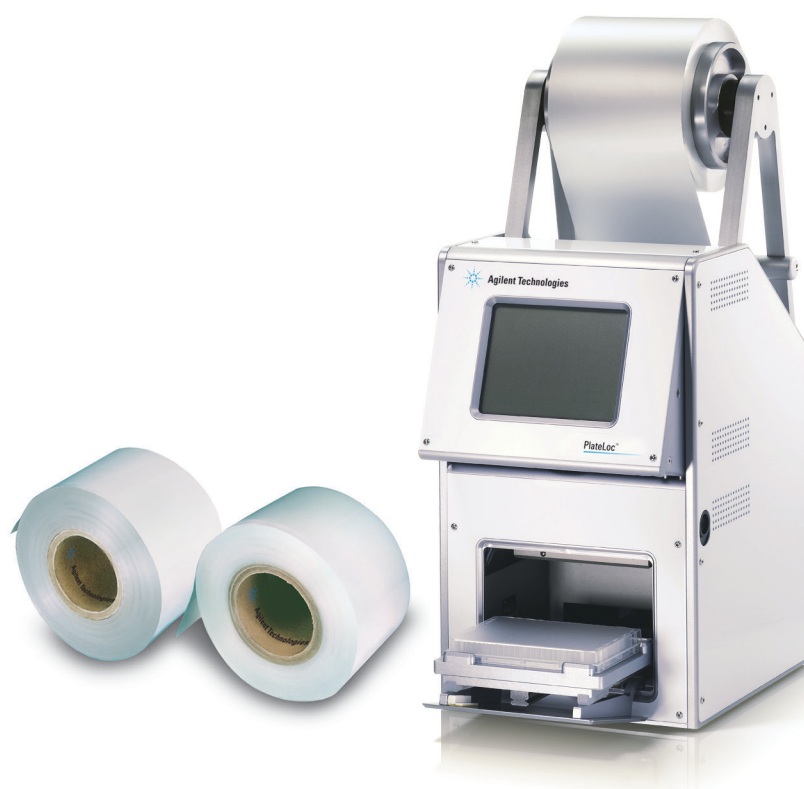
**Notes:**

- 1. Test Microplates.** This data was generated using the following microplates or equivalent: Polypropylene Microplate: Greiner, 650201 (96-well, round well, round bottom); Polystyrene Microplate: Greiner, 655101 (96-well, round well, flat bottom).
- 2. Customer Testing.** Material suitability, label adhesion, image integrity, maximum storage times or conditions, etc. are a function of the specific application and must be determined by the user of this product. It is recommended that all microplate labeling processes take place prior to the "Best if Used By" date, if indicated on the material labeling. Adhesion and image integrity should remain intact past this date—but the actual ideal material storage time is application and storage condition dependent. End-user, application-based requalification (testing) is required past "Best if Used By" date.
- 3. 3rd Party Media: Labels and Ribbons.** The performance of the Agilent Microplate Labeler has been optimized using Agilent consumables. If you choose to try third-party consumables and experience poor performance / instrument problems and contact Agilent for support, it is your responsibility to immediately notify the Agilent support representative that you are using third-party labels and/or ribbon. Use of third-party consumables may be outside the scope of the terms of the Microplate Labeler instrument warranty and may result in the user paying for any necessary repairs and applications support, resulting from the use of these materials. If you are considering the use of third-party consumables because the Agilent consumables do not meet your requirements, please give Agilent the opportunity to try to help.
- 4. Reference.** This information is for reference only.
- 5. Label Size.** The Microplate Labeler design has been optimized for the use of standard size labels (6.35 mm x 50.8 mm / 0.25" High x 2.0" Wide) on labware which meets the Standards ANSI/SBS 1-2004 through ANSI/SBS 4-2004. For non-standard labels, contact the Agilent Automation Solutions Technical Support Team or an Agilent Technical Sales Professional for additional information or to discuss your requirements.

If you have a particular label challenge where you believe you need to place additional content on the label, refer to the Microplate Labeler User's Guide on "**Changing the size of a field on the label**" or contact Technical Support for assistance.

- 6. Media Kit Warranty.** Labels and ribbons are warranted for a period of 90 days after delivery or as required by local law.
- 7. Satisfaction Guarantee.** If you are not satisfied with your Agilent product within the first 60 days, you may return your purchase in its original condition for a full refund or credit. A return policy statement is posted under Product Information on the website. In the US and Canada, please call for a Return Authorization form and return instructions at 1-800-227-9770. If your Agilent product was purchased from a distributor, please contact the distributor.
- 8. Quality and Price Match Guarantee.** A Few Words on How to Stretch Your Budget... Buy Authentic Agilent Consumables.  
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## Agilent PlateLoc Thermal Microplate Sealer Consumables



	Peelable aluminum	Peelable aluminum RT*	Pierceable aluminum	Clear peelable seal	Clear pierceable thin seal	Clear permanent seal
Product number	24210-001	24214-001	06644-001	16985-001	17318-001	24212-001
<b>ADHESION</b>						
Peelable	✓	✓		✓	✓	
Permanent			✓			✓
<b>APPLICATIONS</b>						
Compound storage, low temp (0 °C to -80 °C)	✓	✓		Short Term (Hours to daily) – not for long term storage	Short Term (Hours to daily) – not for long term storage	
Compound storage, room temp (0 °C to +40 °C)		✓**				
Sanger DNA sequencing (for example, ABI 3730)					✓	✓
<b>APPLICATIONS (Typical)</b>						
PCR	✓	✓	✓	✓	✓	✓
PCR/qPCR						
Optically clear for qPCR				✓	✓	✓
<b>DIMENSIONS (sealing film on roll)</b>						
Core diameter	76.2 mm (3") ID	76.2 mm (3") ID	76.2 mm (3") ID	76.2 mm (3") ID	76.2 mm (3") ID	76.2 mm (3") ID
Length of roll	457.2 m (1500 ft)	457.2 m (1500 ft)	500 m (1640 ft)	200 m (656 ft)	370 m (1213 ft)	500 m (1640 ft)
Length used per plate	78 mm (3.07")	78 mm (3.07")	78 mm (3.07")	78 mm (3.07")	78 mm (3.07")	78 mm (3.07")
Plates/roll (min)	5,000	5,000	5,000	2,000	4,700	5,000
Roll diameter	241.3 mm (9.5")	255 mm (10.04")	160 mm (6.3")	203.2 mm (8")	203.2 mm (8")	208 mm (8.2")
Thickness	0.0591 mm (0.002")	0.0700 mm (0.0028")	0.025 mm (0.00098")	0.125 mm (0.005")	0.0762 mm (0.003")	0.049 mm (0.002")
Width	115 mm (4.53")	115 mm (4.53")	115 mm (4.53")	115 mm (4.53")	115 mm (4.53")	115 mm (4.53")
<b>MICROPLATE COMPATIBILITY, AGILENT PLATELOC SEALING CONDITIONS/GUIDELINES</b> (Heat sealing compatible microplates feature a raised rim or "chimney" surrounding each sample well and flat sealing surfaces. Conditions below are starting point recommendations for microplate sealing optimization—plate design can play a significant role in the ideal sealing conditions. Microplates of the same material may require different settings, based on thickness/geometry, etc. Optimize time and temperature parameters for each plate type before use. Use the lowest temperature and shortest time period possible for best results. If warped microplates or plates that do not lie flat are a challenge, or if you experience non-uniformity in seal quality, try Agilent's <b>PlateLoc Flexible Inserts</b> Product Number 15818-002.)						
Cyclic olefin copolymer (COC)	190 °C; 2.5 sec	185 °C; 1.5 sec				
Polypropylene	170 °C; 1.2 sec	175 °C; 1.5 sec	Best Results with Polypropylene 170 °C; 1.2 sec	110 °C; 1–1.2 sec	110 °C; 1–1.2 sec	Permanent 175 °C; 1.2–2 sec
Polystyrene	185 °C; 1.2 sec	Not Compatible	No Data Available	No Data Available	No Data Available	

	Peelable aluminum	Peelable aluminum RT*	Pierceable aluminum	Clear peelable seal	Clear pierceable thin seal	Clear permanent seal
Product number	24210-001	24214-001	06644-001	16985-001	17318-001	24212-001
<b>OPTICAL PROPERTIES</b>						
Autofluorescence	NA	NA	NA	Non-detected	Non-detected	Non-detected
Optically clear (plate reader compatible)	NA	NA	NA	✓	✓	✓
Transparent, visually	NA	NA	NA	✓	✓	✓
<b>PHYSICAL PROPERTIES</b>						
Appearance	White top, reflective bottom	Uncolored aluminum foil	Reflective top and bottom	Opaque unsealed, transparent sealed	Opaque unsealed, transparent sealed	Clear unsealed, clear sealed
Cross contamination/leakage resistant	✓	✓	✓	✓	✓	✓
Evaporation resistant	✓	✓	✓	✓	✓	✓
Material	Multilayer aluminum foil/polymer laminate	Multilayer aluminum foil/polymer laminate	Aluminum foil w/ thermal sealant layer	Multilayer polymer laminate	Multilayer polymer laminate	Multilayer polymer laminate
O <sub>2</sub> Barrier	Excellent	Excellent		Good	Good	Good
H <sub>2</sub> O Vapor barrier	Excellent	Excellent	Excellent	Good	Good	Good
<b>PIERCEABILITY</b>						
Seal piercer			✓		✓	
Metal tip/probe					✓ (Some, e.g. ABI 3730)	
Handheld pipettor plastic tips	Fair		✓			
<b>THERMAL PROPERTIES</b>						
Seal integrity range	-80 °C to Plate Softening	-80 °C to 40 °C**	-20 °C to 80 °C	-20 °C to 120 °C	-20 °C to 120 °C	-80 °C to 110 °C

\* Before using the Peelable Aluminum RT heat seal, determine if your PlateLoc Thermal Microplate Sealer requires an adjustment to ensure compatibility. PlateLoc instruments manufactured before 2011 may require adjustment by an Agilent Field Service Engineer. Please contact Agilent Automation Technical Support for more details.

\*\* Room temperature storage of 100 % DMSO for 12 months. Short term resistance to 40 °C for a few weeks.

## PlateLoc Seal Selection Guide Notes

**Tested Microplates.** These data were generated using the following microplates or equivalent:

- Polypropylene Microplate: Greiner, 650201 (96-well, round well, round bottom)
- Polystyrene Microplate: Greiner, 655101 (96-well, round well, round bottom)

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