

Labcyte®

CONSUMABLES

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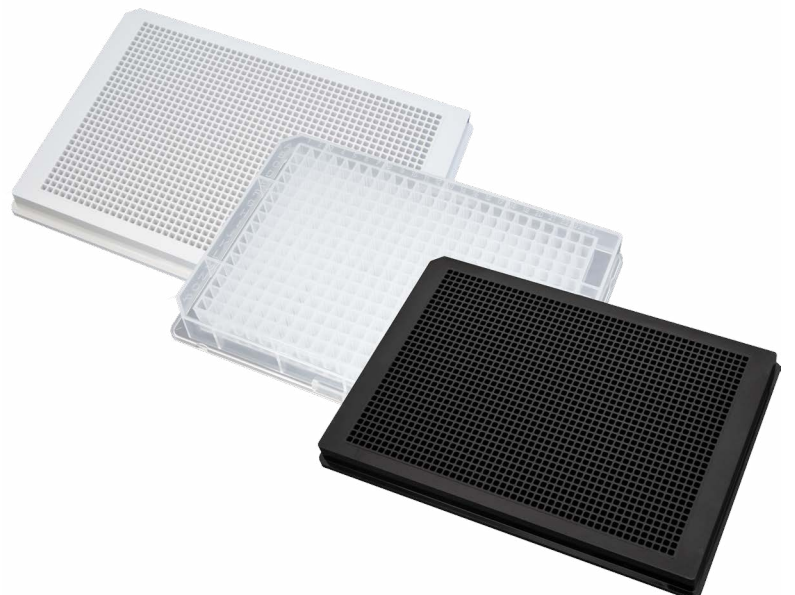
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Labcyte Overview

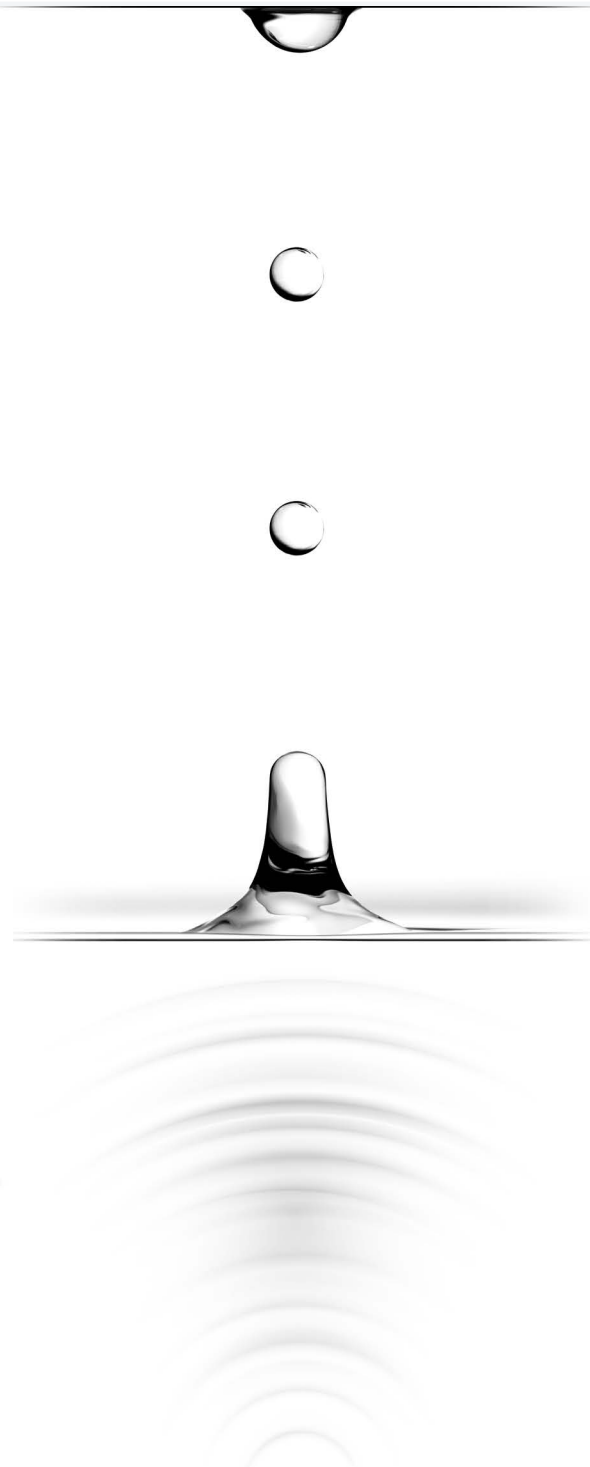
About Labcyte Inc.

Labcyte innovations have enabled scientists to enhance personalized medicine programs, streamline DNA/RNA diagnostic testing, optimize drug discovery pipelines, and accelerate life science research. Labcyte customers have published papers in peer-reviewed journals and received patents that clearly demonstrate discoveries and results that would have been impossible with traditional liquid-handling approaches — all at a fraction of the cost.

Echo® Acoustic Liquid Handling Systems

The Echo Liquid Handlers revolutionize liquid handling by using acoustic energy to transfer fluids. The instrument focuses sound waves directly under a microplate well and 'listens' for the reflection (or echo) to determine the fluid height and composition. Sound waves then eject precisely-sized droplets from the source microplate to a destination microplate, slide or other surface.

The Echo systems do not use tips, pin tools or nozzles — completely eliminating contact between the instrument and the sample. Fluids are transferred in nanoliter increments. Larger volumes are achieved by transferring hundreds of droplets per second.

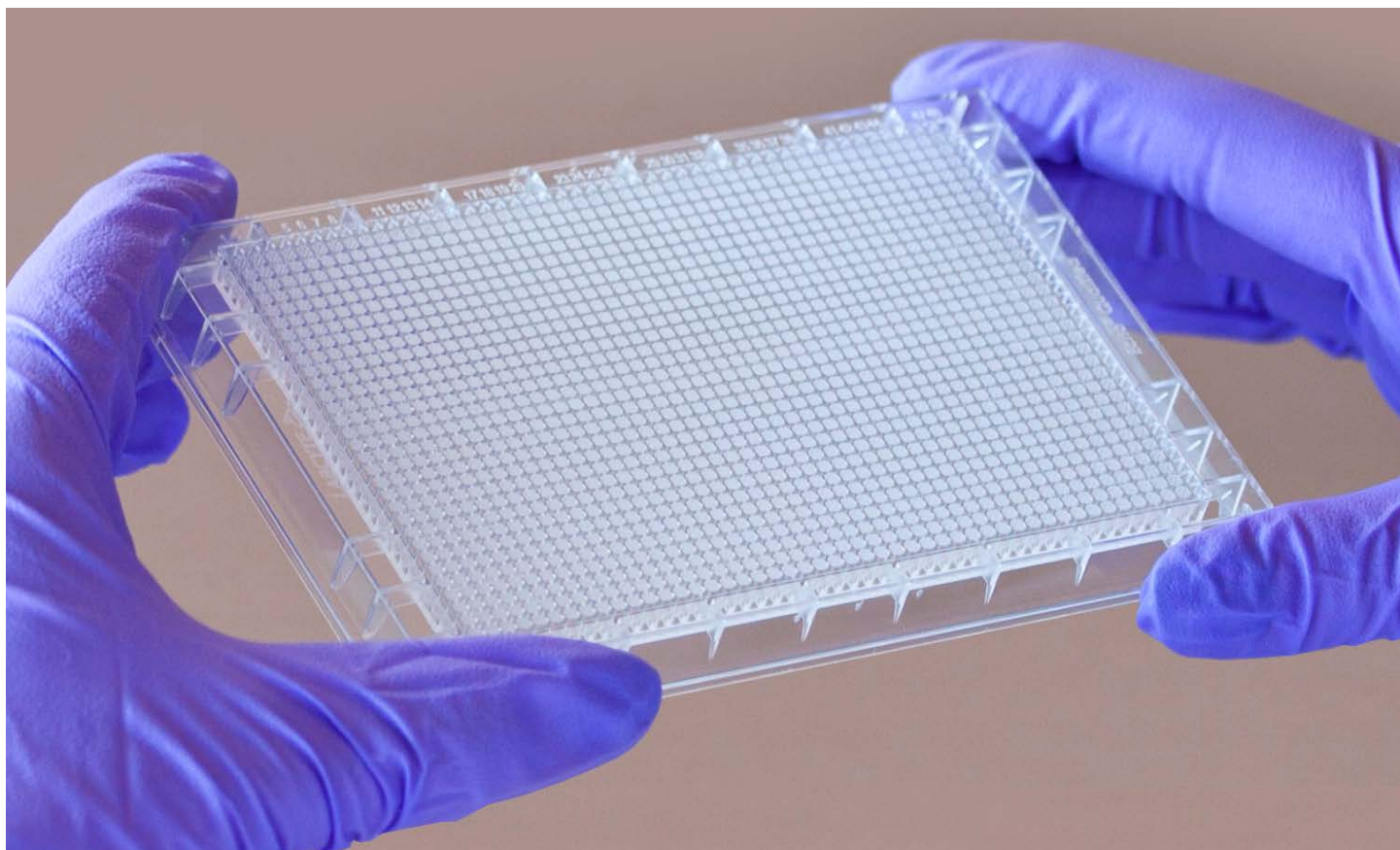


The Echo Acoustic Advantage

- ▶ Low transfer volumes enable the miniaturization of assays
- ▶ Provides unsurpassed accuracy and repeatability of results at all volumes
- ▶ Preserves sample integrity and viability during transfer
- ▶ Increases flexibility in transferring liquids at different positions and volumes
- ▶ Reduces operating costs by minimizing reagent usage, eliminating disposable tips, and reducing waste
- ▶ Dynamic Fluid Analysis™ allows the transfer of multiple fluid types and concentrations from a single plate

Precision Design and Manufacturing

Echo® Qualified Microplates must meet the highest specifications to achieve the performance expected from Echo Liquid Handlers. Only plates that are exceptionally flat with extremely low inter- and intra-plate CVs are considered qualified for use on Echo systems.



Designed to minimize dead volume for acoustic transfer

Echo Qualified Low Dead Volume

The Echo® Qualified Low Dead Volume (LDV) Microplates are designed to minimize dead volume for acoustic transfer. Wells taper to minimize surface area at the bottom of the microplate, ensuring maximal volumes can be transferred.

When used as an assay microplate, the LDV microplate improves results through increased signal to baseline ratios. The LDV family of microplates have exceptional flatness, which reduces assay noise by providing a consistent measurement position for detection instrument using photomultiplier tubes or CCD devices.

Echo® Qualified Source Microplates

Reliable Acoustic Liquid Transfers Require the Best Microplates

Echo Liquid Handlers are designed to use Labcyte® Reservoir, 384-well, and 1536-well Source Microplates for precise and accurate liquid transfer. Echo Liquid Handlers are tuned and calibrated to Echo Qualified Source Microplates to ensure the highest transfer performance. Echo Qualified Source Microplates are lot tested for every critical microplate parameter vital to acoustic liquid handling precision and accuracy.



Echo® Qualified 384LDV Microplate

Key Features

- ▶ **Designed and manufactured for use with Echo Liquid Handlers**
- ▶ **Echo Qualified**
 - Lot tested for dimension, functional performance, and sealing
 - Low intra- and inter-plate CVs
 - Enables high precision transfers for a broad volume range and fluid types
 - High accuracy and linearity of DMSO hydration measurements
- ▶ **Anti-static - microplates are deionized, then packed in anti-static bags**
- ▶ **Solvent resistant - made of cyclic olefin copolymer or polypropylene**
- ▶ **DNase/RNase free**
- ▶ **Compatible with automation - Meets ANSI/SLAS 1-2004, 2-2004, 3-2004 and 4-2004 standards**

Only microplates that are labeled “Echo Qualified” are suitable for use on Echo Liquid Handlers. Other microplates that are positioned as “acoustic” compatible are not manufactured to the same specifications as Echo Qualified Microplates. Labcyte qualifies each lot of microplates on Echo systems to ensure that each microplate will deliver the superior precision and accuracy expected from Echo systems. Using inferior microplates can lead to variation in droplet volume and/or missed ejections, both of which cause poor precision and accuracy.

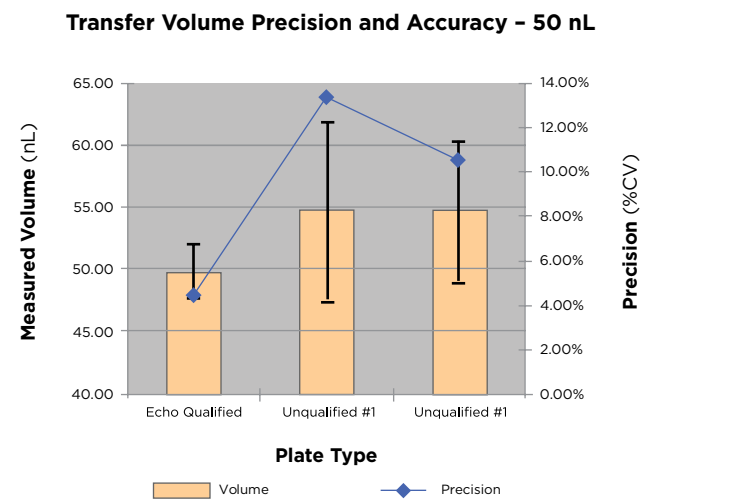
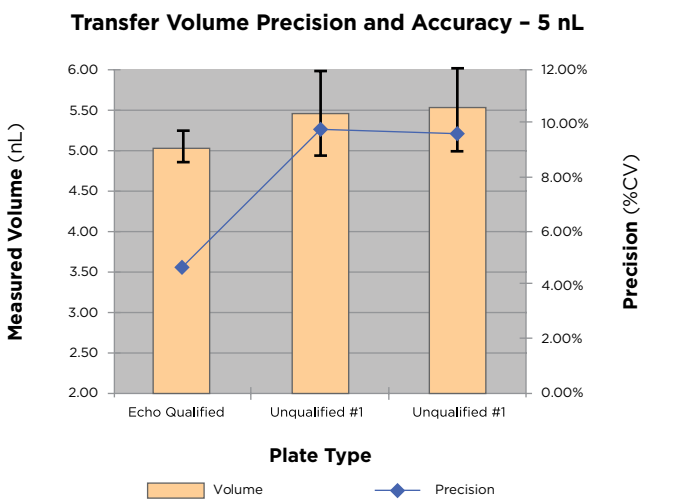


FIGURE A: Echo Qualified Microplates yield greater precision and accuracy at low and high transfer volumes

Superior Precision and Accuracy

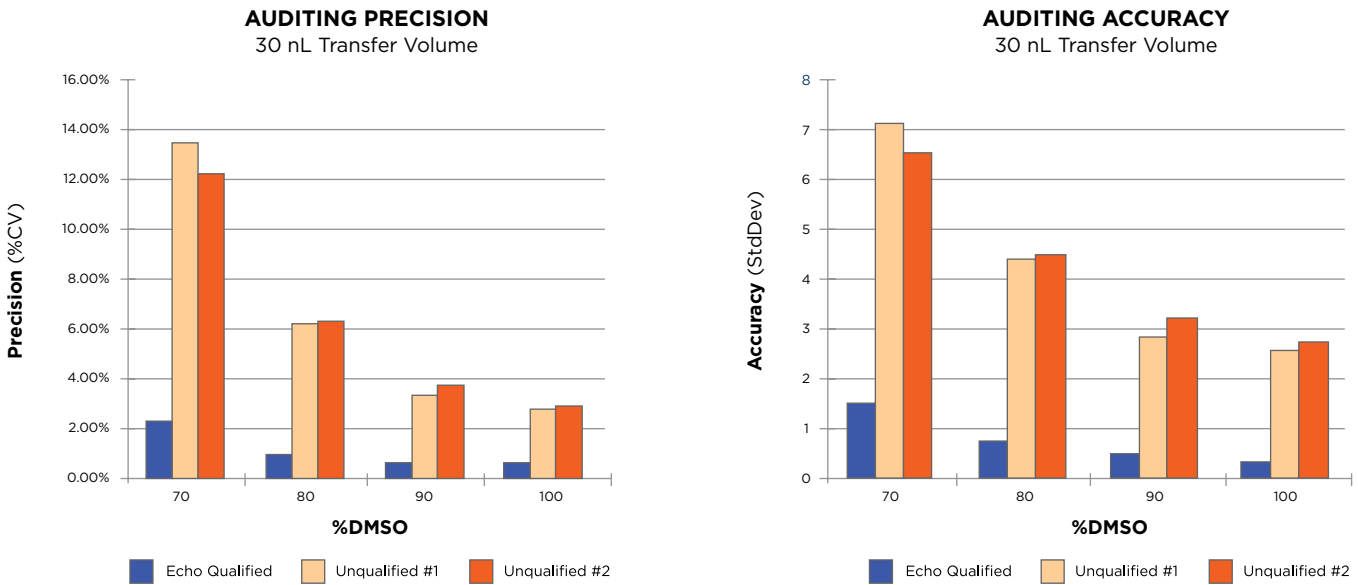


FIGURE B: Echo Qualified Microplates yield greater precision and accuracy of DMSO hydration measurements

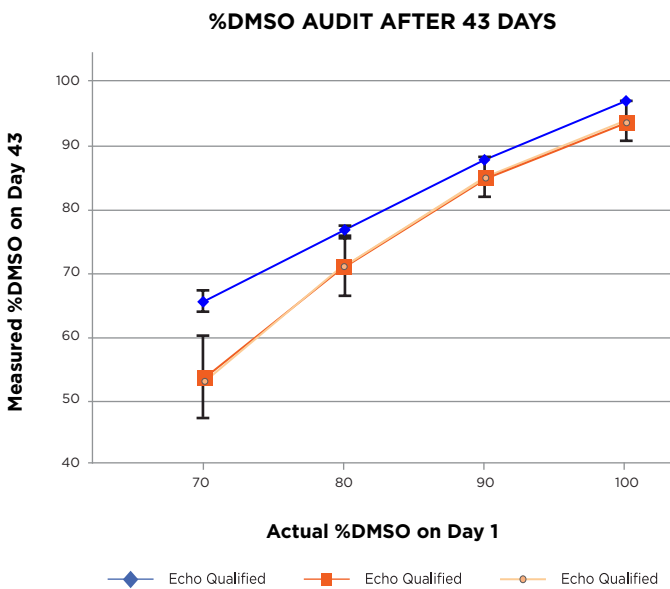


FIGURE C: Echo Qualified Microplates yield DMSO hydration measurements with greater linearity

Value-added Quality Control

In addition to precise and accurate transfer of fluids, the combined use of the Echo Liquid Handler with Echo Qualified Microplates has auditing functions that provide quality control of fluid samples. The Echo Liquid Handler applies a low-energy sound pulse to the fluid sample in each well, and the reflected signal is used to calculate the following:

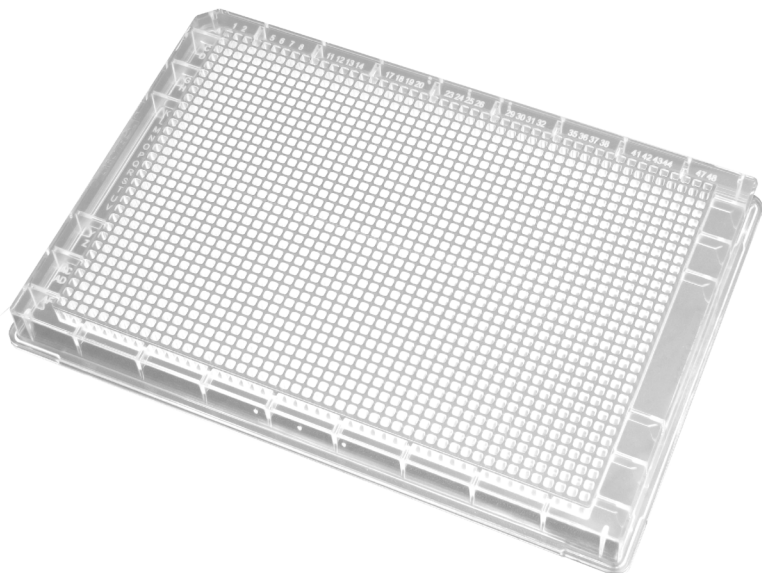
- ▶ **Aqueous solutions:** approximate fluid volume in the well based on the measured fluid height
- ▶ **DMSO-based solutions:** fill height and DMSO/water concentration
- ▶ **Glycerol-based solutions:** fill height and percentage of glycerol concentration (up to 50%)
- ▶ **Protein crystallography fluids:** fill height and impedance measurement in mega Rayls (unit of acoustic impedance)

Deionized and Anti-Static

Echo Qualified Microplates are deionized during manufacturing and packaged in anti-static bags to ensure precise drop placement during liquid transfers. A buildup of static charge can alter the directionality of the liquid transfer and lead to inaccurate transfers and cross-contamination.

384LDV and 1536LDV Microplates (Cyclic Olefin Copolymer)

The Echo Qualified 384-well and 1536-well LDV Plate designs minimize dead volume when used with the Echo Liquid Handler. The enhanced design of the Echo Qualified 1536LDV Microplate reduces dead volume by 50%, increases working range by 12.5% and increases throughput by 15% when compared to other 1536-well acoustically compatible microplates.



Echo® Qualified 1536LDV Microplate

Key Features

- ▶ Free of halogen, BPA, heavy metals, and oxidizers
- ▶ Known to have fewer leachables than polystyrene
- ▶ High rigidity and strength
- ▶ Resistance to heat distortion of up to 170°C

The construction of microplates from cyclic olefin copolymer (COC) provides optimal acoustic transfer with uniform well geometry, a key to achieving a lower dead volume. The COC microplate construction also provides superior structural integrity and rigidity, and is chemical resistance to most standard laboratory organics including DMSO, making them ideal for chemical compound storage.

384PP 2.0 and Reservoir Microplates (Polypropylene)



Echo® Qualified 384PP 2.0 Microplate

Echo Qualified Source Microplates meet tight specifications for flatness and rigidity and are required to ensure accurate and precise transfer with the Echo Liquid Handler. Because of their high resistance to solvents including DMSO and buffers, the 384PP 2.0 Microplate is ideal for compound and sample storage.

The Echo Qualified Reservoir is designed to enable convenient and affordable large reagent-volume transfers on the Echo 525 Liquid Handler. Its 6-well design enables the transfer of over 15 mL from a single Reservoir plate, and its low dead volume enables efficient dispensing of costly and precious reagents and samples. The working volume for each of the six wells is over 2.5 mL and the dead volume (less than 10% of the maximum working volume) is recoverable. The welded lid minimizes evaporation and prevents cross-contamination and splashing when centrifuged or handled.

Echo® Qualified Reservoir

The Echo Qualified Reservoir is designed to enable convenient and affordable large volume transfers on the Echo 525 Liquid Handler. Its 6-well design enables the transfer of over 15 mL from a single Reservoir plate. The low dead volume of the Reservoir enables scientists performing genomic, proteomic and cell-based assays to efficiently dispense costly and precious reagents and samples. The working volume for each well is 2.55 mL and the dead volume of the Reservoir is less than 9%.



Key Features

- ▶ **Echo Qualified**
Manufactured and lot tested to ensure the highest Echo Liquid Handler performance
- ▶ **Dispense up to 2.55 mL per well***
- ▶ **Maximum 250 µL dead volume per well****
(< 9% of maximum fill volume)
- ▶ **Recoverable dead volume**
- ▶ **DNase/RNase free**
- ▶ **Robotics and automation compatible**
- ▶ **Heat seal and MicroClime® Lid compatible**
- ▶ **Meets ANSI/SLAS 1-2004, 2-2004, and 3-2004 standards**

* Maximum volume may increase, depending on fluid type

** Dead volume may decrease, depending on fluid type

Echo® Qualified Reservoir

ECHO® RESERVOIR TRANSFER ACCURACY

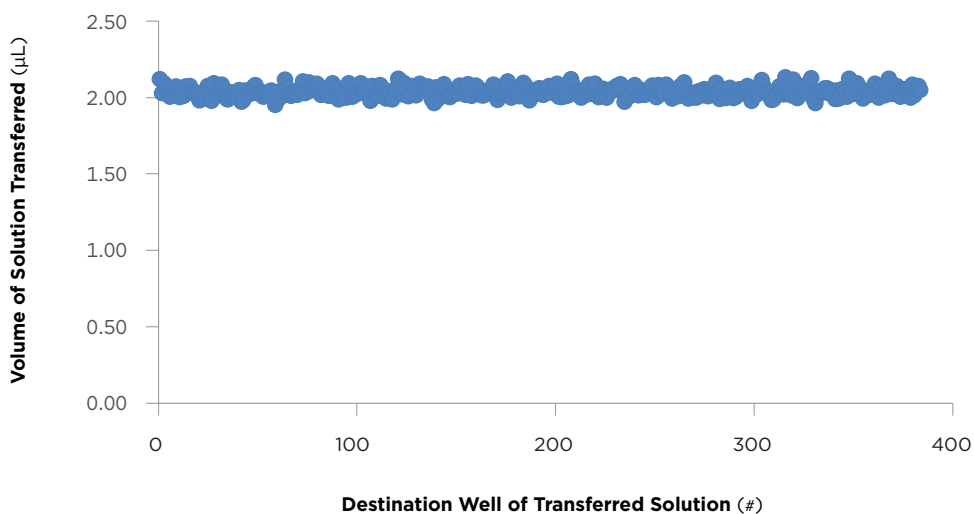
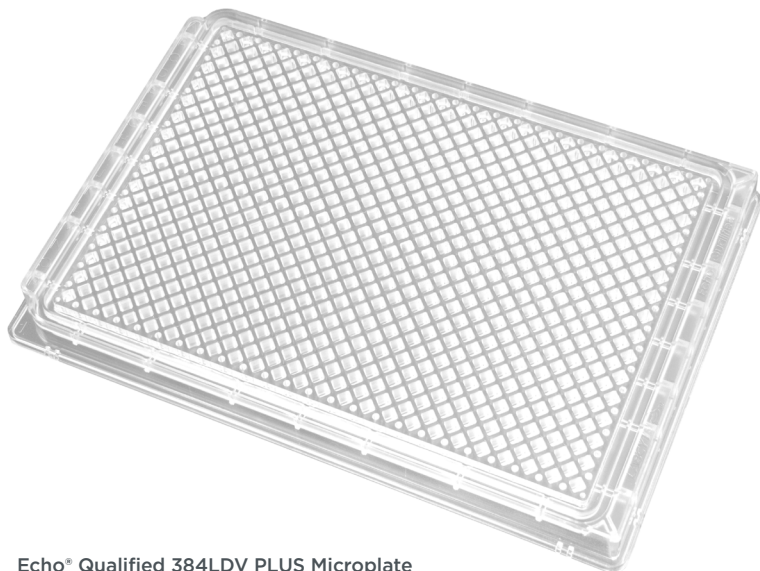


FIGURE D: Dispensing full range (2.8 to 0.2 mL) from Reservoir to successive 384-well plates

384LDV PLUS and 384PP PLUS Microplates



Echo® Qualified 384LDV PLUS Microplate

The Echo® Qualified 384LDV PLUS and 384PP PLUS Microplates are designed for use with the Echo 525 Liquid Handler. These microplates have been specially optimized for high precision, aqueous transfers into 1536-well microplates using the Echo 525 Liquid Handler. The design and construction of the Echo Qualified 384LDV PLUS Microplate minimize dead volume, enabling efficient aqueous liquid transfers.

Tissue Culture-treated Microplates

Tissue culture treated source microplates enable assay workflows to be simplified when used with the Echo Liquid Handler. Cells can be grown, conditioned and lysed in a single tissue culture treated microplate well. The Echo Liquid Handler can then dispense the sample to an assay plate for testing. The tissue-culture treated microplates are available in 1536-well, low dead volume and 384-well polypropylene microplate formats.

Key Features

- ▶ **Echo Qualified**
Manufactured and lot tested to ensure the highest Echo Liquid Handler performance
- ▶ **Transfer cell lysate with an Echo Liquid Handler**
- ▶ **Supports both adherent and suspension cell growth**
- ▶ **Supports growth of a wide variety of adherent cell lines, including CHO and HepG2**
- ▶ **Buffer working range:**
2 - 5 μ L (1536-well); 15 - 65 μ L (384-well)
- ▶ **RNase and DNase free, sterile, and lidded**

Echo Compatibility Chart

Echo Plate Type	Echo® 520	Echo® 550	Echo® 555	Echo® 525	Catalog Number
384PP 2.0	✓	✓	✓	✓	PP-0200
384PP TC	✓	✓	✓	✓	PPT-0200
384PP PLUS				✓	PPL-0200
384LDV	✓	✓	✓		LP-0200
384LDV PLUS				✓	LPL-0200
1536LDV	✓	✓	✓		LP-0400
1536LDV-TC	✓	✓	✓		LPT-0400
Reservoir				✓	ER-0050

TABLE 1: Echo Liquid Handler source plate selection table

Labcyte® Assay Plates

The Labcyte® LDV Microplates improve assay results through increased signal to noise ratios. The exceptional flatness of this microplate reduces assay noise by providing a consistent measurement position for detection instrumentation using photomultiplier tubes or CCD devices. This microplate is constructed of cyclic olefin copolymer (COC) which provides optical clarity and improved signal levels for luminescence and fluorescence based assays.



Echo® Qualified 384LDV Microplate (Black)

Key Features

- ▶ Made of cyclic olefin copolymer
- ▶ Superior signal to background ratios
- ▶ Consistent color and clarity
- ▶ Highly uniform thickness of well walls and bottoms
- ▶ Compatible with heat sealing devices
- ▶ Designed for robotic handling and barcode customization
- ▶ Meet Standards ANSI/SLAS 1-2004, 3-2004, and ANSI/SLAS 4-2004

Black and White Cyclic Olefin Copolymer

Black and white COC microplates reduce background to improve assay sensitivity, minimize crosstalk, and prevent light piping between wells. The black COC microplates are highly suitable for use in Fluorescence Polarization (FP) based and Homogeneous Time Resolved Fluorescence (HTRF) screening assays. For both applications, these microplates demonstrated higher Z' values when compared to those of black polystyrene microplates and may be a factor in improving the assay window for FP and HTRF-based assays.

White COC microplates are designed for luminescence and scintillation proximity assay applications. White COC microplates minimize crosstalk, reduce background, offer higher reflectivity to enhance signal, and improve dynamic range and signal-to-noise ratio.



Echo® Qualified 1536LDV Microplate (White)

MicroClime® Environmental Lid

The MicroClime® Environmental Lid minimizes edge effects and preserves the concentrations of solutions in microplate wells. The MicroClime Environmental Lid incorporates a novel, fluid-absorbing matrix that creates a vapor barrier, protecting the sample from the exterior environment from evaporation or hydration and greatly reducing edge effects. By eliminating edge effects, the MicroClime lid enables the use of every microplate well, thereby increasing microplate efficiency by 37%.

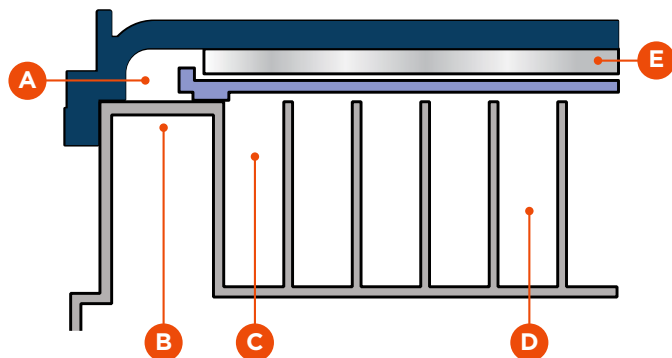


MicroClime® Environmental Lid

The liquid in the MicroClime Lid evaporates to fill the headspace with a vapor-saturated atmosphere, retards the evaporation in the wells, and acts as a barrier to infiltration of external gases.

Key Features

- ▶ Eliminates microplate edge effects
- ▶ Increase microplate efficiency by up to 37%
- ▶ Compatible with a wide range of solvents
- ▶ Can be filled manually or with automated bulk fillers



- A and C:** Regions of saturated vapor
- B:** Sealing surface
- D:** Microplate well
- E:** Fluid-saturated polypropylene felt

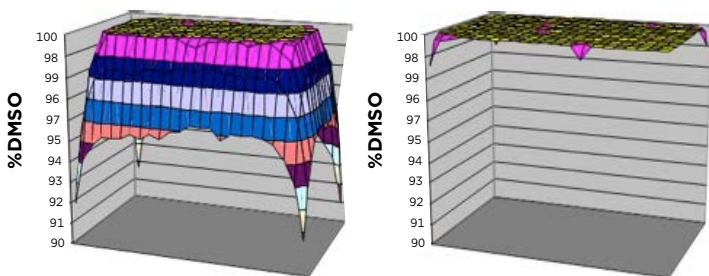


FIGURE F: MicroClime Lid eliminating DMSO hydration edge effect. Every well of two 384-well microplates was filled with 30 μL of dry DMSO (45% r.h., 22°C). The plate on the left was covered with a standard lid and the plate on the right was covered with a MicroClime Lid filled with DMSO. The water concentration of each well was measured acoustically after 20 hours.

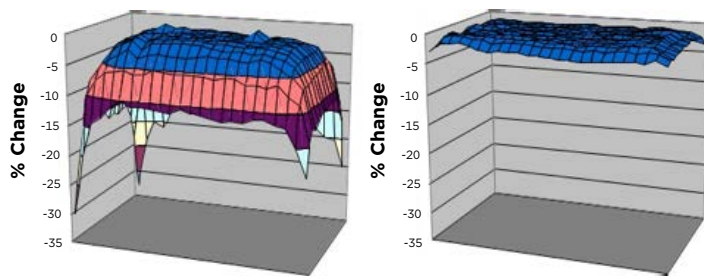


FIGURE G: MicroClime Lid eliminating aqueous evaporation edge effect. Each well of two 384-well plates were filled with 50 μL of water. The plate on the left was covered with a standard lid and the plate on the right was covered with a MicroClime Lid that had been filled with water. Graphs show the loss of depth (volume) in the edge wells over a 72-hour period.

Product Selection Guide

MicroClime® Lid Products

Product	Quantity	Catalog Number
MicroClime® Environmental Lid – Introductory Pack	10 / pack	LL-0310-IP
MicroClime® Environmental Lid Sterile – Introductory Pack	10 / pack	LLS-0310-IP
MicroClime® Environmental Lid	50 / case	LL-0310
MicroClime® Environmental Lid Sterile	50 / case	LLS-0310

Labcyte® Microplate Products

	Echo® Qualified 384-well LDV	Echo® Qualified 384-well LDV PLUS	Echo® Qualified 1536-well LDV	Echo® Qualified 1536-well LDV, Clear, TC-treated	Echo® Qualified 384-well PP	Echo® Qualified 384-well PP PLUS	Echo® Qualified 384-well PP, TC-treated	Echo® Qualified Reservoir
Catalog Number	LP-0200 (clear) LP-0210 (black)	LPL-0200	LP-0400 (clear) LP-0410 (black) LP-0420 (white)	LPT-0400	PP-0200	PPL-0200	PPT-0200	ER-0050
# of wells	384	384	1536	1536	384	384	384	6 (2 X 3)
Echo models (source plate)	520 / 550 / 555	525	520 / 550 / 555	520 / 550 / 555	All - 520 / 525 / 550 / 555	525	All - 520 / 525 / 550 / 555	525
Working volume	DMSO: 2.5-12 µL Buffer: 3-12 µL Buffer/protein: 6-14 µL	4.5 – 14 µL	1 – 5.5 µL	1 – 5.5 µL	20 – 50 µL	20 – 50 µL	20 – 50 µL	250 – 2,800 µL
Dead volume (Echo)	< 2.5 µL	4.5 µL	< 1 µL	< 1 µL	< 20 µL	< 20 µL	< 20 µL	250 µL
Well profile	LDV	LDV	LDV	LDV	Flat bottom	Flat bottom	Flat bottom	Tapered
Well shape	Diamond	Diamond	Square	Square	Square	Square	Square	Rectangular
Material	COC	COC	COC	COC	PP	PP	PP	PP
Color Options	Clear/Black	Clear	Clear/ Black/ White	Clear	Clear	Clear	Clear	Clear
Coating	None	Surface Treated	None	Tissue culture treated	None	Surface treated	Tissue culture treated	Surface treated
Lidded	No	No	No	Yes	No	No	Yes	No
Quantity per case	50/case	50/case	50/case	50/case	100/case	100/case	100/case	50/case



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