

Assay-ready plate preparation

mosquito[®] Application Note

Background

Assay-ready plates are becoming key to maximizing throughput for many HTS departments. These plates contain test compounds prepared from library stocks ahead of time at the correct concentrations.

DMSO is routinely used for compound dissolution, but its presence at concentrations above 1% can markedly affect assay performance.

Thus, accurate nanolitre quantities of DMSO-based stock solution are required to keep concentrations low when preparing assay-ready plates. Non-disposable pipetting heads have been traditionally used to achieve this, but require very stringent wash steps to avoid cross-contamination problems when transferring some compounds.



Application

The mosquito[®] nanolitre pipettor (TTP LabTech) offers positive displacement, disposable micropipettes which guarantee zero cross-contamination. Its positional accuracy of better than 0.05mm in the X, Y and Z axes. Together, these features give mosquito[®] unrivalled accuracy and repeatability for the complex transfer operations required to deliver nanolitre volumes directly from the compound stock to the assay plate.

mosquito[®] can prepare assay-ready plates very quickly. A 384 to 384 plate replication takes less than 3½ minutes; and a 384 to 4 x 384 replications takes under 7 minutes. No time-consuming wash cycles are required!

Assay-ready plate preparation requires accurate nanolitre quantities of DMSO stock solution.

mosquito[®] enables accurate and rapid assay-ready plate preparation. This method is applicable to 384 well microplates and is automation-friendly.

mosquito[®] Features

Zero cross-contamination

Volume range of 50nL – 1,200nL

Negligible dead volumes reduce sample wastage

Addresses 96, 384 and 1536 plate formats

CVs of <8% at 50nL and <4% at 100nL

Accuracy within +/-5% across the volume range

Easy integration with other robotics



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Working range	25nL – 1200nL in increments of 1nL
Dispensing method	Piston-controlled positive displacement from tips
Accuracy	<8% at 50nL, 5% at 100nL
Plate types	Any SBS standard plate types of 48, 96, 384 and 1536 configuration
Plate reformatting	Can reformat 96 to 384, 96 to 1536, or 384 to 1536 in one protocol
Speed	System versatility saves time as it can perform both plate duplication (3.5 mins plate to plate) and intra-plate serial dilutions in the same run
Suitable liquids	Positive displacement pipettes can aspirate/dispense a variety of liquid viscosities such as EtOH, H ₂ O, DMSO, glycerine and polyethelene glycol
Dead volumes	Negligible – approximately 10nL over-aspiration required for normal functioning
Washing time	Not required, due to disposable pipettes
Deionisation step	Not required
Ease of use	Simple, user-friendly interface which supports multiple user environments
Ease of maintenance	Minimal maintenance. Depending on use, it is recommended that 10 mins is spent recalibrating for every 36,000 tips used
Integration	Mosquito can be easily integrated with a wide variety of robotic plate movers and liquid handlers to allow the operator to walk away with confidence

