

## IC50/Serial Dilution Application Overview

Innovadyne liquid handlers can be readily configured to make serial dilutions of compounds in DMSO and perform subsequent IC50 screening. Innovadyne's technology is well suited to the performance of the dilution plates and the screens due to the hybrid syringe/solenoid aspirate and dispense architecture. DMSO is readily handled with the use of double air gaps and an intermediary DMSO solvent plug that acts as a buffer between the DI water-based system fluid and the DMSO sample.

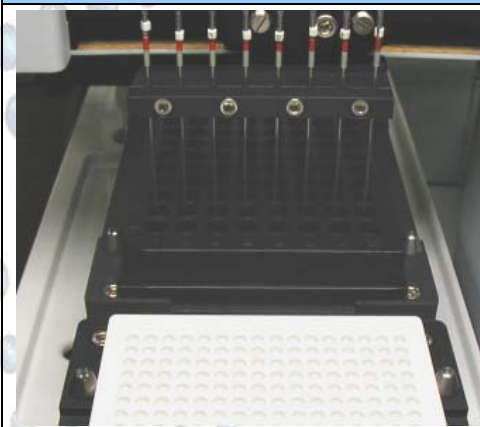
The design allows a user to perform a serial dilution series using the traditional liquid handling, syringe-based component for aspirating, mixing and dispensing. IC50 screens can be run at low volumes using the solenoid-based, non-contact dispense component. Using the Nanodrop II it is possible to perform the required DMSO dilutions and follow the dilution protocol with screens utilizing the second plate position. Alternatively, a pre-diluted plate may be placed in one plate nest with iterative protocols performed using the second plate nest and a plate feeding device. Integration drivers for a variety of plate handlers are commercially available.

In the application note "Developing a Sterile, Reliable Laboratory Setup for Low-Volume Tuberculosis Antibiotic Discovery Assays", developed with the Novartis Institute for Tropical Diseases (Singapore), Novartis tested a Nanodrop II's performance in dispensing 90% v/v DMSO/water. The average precision (% CV) was 6.19, 2.76 and 3.16 for 250, 500 and 1000nL volumes respectively and the accuracy for all volumes showed a deviation from expected volume transferred of less than 10%.

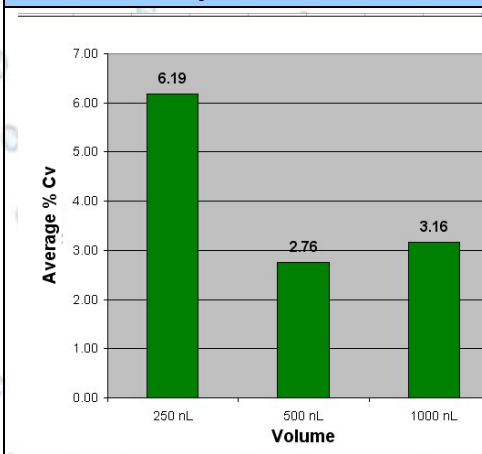
Subsequently a total of 100 96-well plates were dispensed over a 6-week period to screen 8800 compounds from the Novartis compound archive against Calmette-Guerin mycobacterium, with control plates consisting of a streptomycin dose-response curve (11 concentrations from highest concentration of 20µM diluted serially 2-fold in 90% DMSO/water). The dispensing results are as shown:

Avg. signal-to-background, 100 plates	10.1
Avg. z-factor, 100 plates	.89

### Nanodrop II Performing Transfer



### Average Precision (%Cv) of 90% DMSO Dispensing at 3 Dispense Volumes



## Application Notes

- **Developing a Sterile, Reliable Laboratory Setup for Low-Volume Tuberculosis Antibiotic Discovery Assays (M065)**

## Technology Briefings

- **High Precision, Non-Contact Dispensing (M002)**
- **Low-Volume Dispensing with the Nanodrop (M021)**

## Features (all platforms)

- DMSO compatible system material
- Valve-free fluid path isolates valves and syringes from solvents
- Syringe aspirate and dispense for serial dilutions
- Solenoid dispense for assays reduces total assay volumes
- Easy to maintain and clean
- Flexible aspirate and dispense settings
- Low-dead volumes
- Large dynamic volume range: 100 nL-40 uL
- 96, 384, 1536, 3456 plates (including low-profile and deep well)
- User-friendly software
- Simple to integrate with drivers available from most integrators

## Platforms

Item	Description	Plate Positions	8-Tip Head	16-Tip Head	96-Tip Head	Syringe Channels	1,4, or 8-Tip Additions to all Wells
11638	Nanodrop II stage and fluidics	2	Yes	-	-	8	Yes
11164	Screenmaker 96+8	5	Yes	-	Yes	16	Yes
12027	Platemaker HTS	5	Yes	-	Yes	104	Yes

## Software

Item	Description
11727	Nanobuilder
10591	Nanodrop GUI (for Nanodrop only)

## Accessories

Item	Description
11193	Reagent refill system (Nanodrop)
11731	Orbital shaker (all platforms)

## Specifications (all platforms)

<b>Return-To-Spot Accuracy</b>	0.1 mm
<b>Aspiration Range, 8-Tip Head</b>	0.1-500µL
<b>Dispensing Range (8-Tip Non-Contact)</b>	0.1-40µL
<b>Dispensing Range (96-Tip)</b>	Screenmaker: 0.1-125µL Platemaker: 0.1-80µL
<b>Dispensing Precision, 8-Tip Head</b>	CV<10% at 100nL, CV<7% at 200nL, CV<5% at 1µL
<b>Dispensing Precision, 96-Tip Head</b>	CV<15% at 100nL, CV<10% at 200nL, CV<5% at 1µL
<b>Dispensing Accuracy, 8-Tip Head</b>	±10% at 100nL, ±7% at 200nL, ±5% at >1 µL
<b>Dispensing Accuracy, 96-Tip Head</b>	Screenmaker: ±10% at 100-500nL, ±5% at >1 500nL Platemaker: ±10% at 100nL, ±7% at 200nL, ±5% at >1 µL
<b>Dead Volume, 8-Tip head</b>	1.5µL/channel at 1µL across 384-well plate
<b>Dead Volume, 96-Tip head</b>	<1µL/channel
<b>Syringe Capacity</b>	500, 1000µL