

## Cell Dispensing Application Overview

Innovadyne liquid handlers address your dispensing requirements for dispensing viable cells and difficult-to-dispense cell media. Traditional and flow-through liquid handlers can be destructive to live cells, and have problems with contamination and clogging of flow paths. In contrast, Innovadyne instruments, with a valve-free fluid path, perform fast dispensing of cells without the stressing of cells that occurs with flow-through solenoid or peristaltic technologies. The Nanodrop has dispensed sensitive cell lines, such as MV 411 Leukemia, with no loss of viability. Subsequent dosing of cell assays can be performed over a dynamic range of five orders of magnitude, with volumes of 50 nL to 500  $\mu$ L.

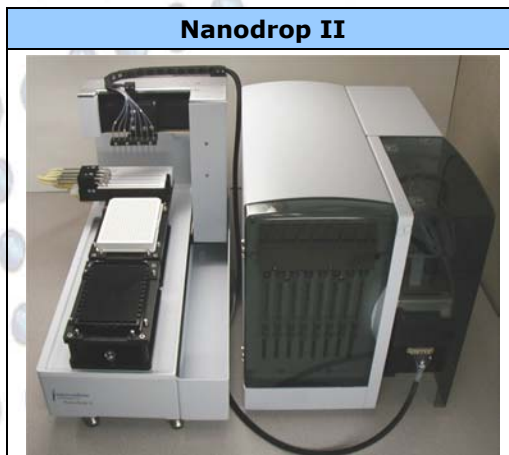
The result is significantly improved cell viability, increased throughput for sample processing, and reduced volume of reagents. Innovadyne's easily changed nozzle harnesses facilitate sterilization protocols if necessary.

In the application note "High-Precision Dispensing of Live Cells in a 1536-Well Format", developed in collaboration with DiscoverX Corp. (Fremont, CA), we dispensed CHO-K1 cells at a density of 1000 cells/well into 1536-well Greiner plates using a Nanodrop II. (2  $\mu$ L of cells and 2  $\mu$ L CellTiter-Glo reagent were added to each well). The cell viability of hand-pipetted cells and cells dispensed by the Nanodrop was comparable to within about 5%. Whole-plate Cv's were in the range of 3.5% to 4.5%.

### Whole-Plate Cv's for CHO-K1 Cell Dispensing

Condition	12 psi	20 psi
PBS suspension	4.5%, 4.1%	3.6%, 3.8%
F12K media	4.1%, 4.3%	-
Fast aspiration*/PBS suspension	4.2%, 4.3%	-

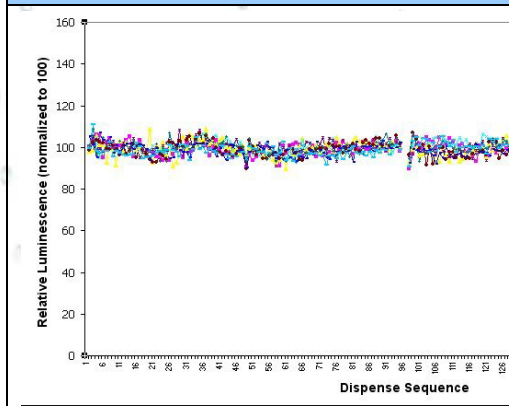
In the application note "Cell Media Dispensing using the Nanodrop", successful dispensing of three types of cell culture media (F-12K, F-12K with 1% FBS, and F-12K with 1% BSA) was demonstrated at two dispense volumes (1  $\mu$ L and 3  $\mu$ L) into a total of 18 plates, with Cv values at 4% or below for all plates.



**Nanodrop II**



**Paddle Wheel Stirrer and Wide-Bore Nozzles**



## Application Notes

- **High-Precision Dispensing of Live Cells in a 1536-Well Format (M069)**
- **Cell Media Dispensing using the Nanodrop (M029)**

## Technology Briefings

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

## Features (all platforms)

- Valve-free fluid path greatly reduces stress to cells
- Remote placement of solenoid cushions pressure pulse impact on cells
- Wide range of pressure settings to minimize shear
- Cell plating and dosing possible on a single platform
- Easy to maintain and clean
- In use at major pharma and biotech companies, who confirm good cell viability with Nanodrop platforms (contact us for references)
- Flexible aspirate and dispense settings
- User defined syringe speeds and pressure set points
- Ability to clean nozzles between runs
- 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)
	Wide-bore tip set (200 µm) (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