SimPrep

Automated Liquid Handling Station
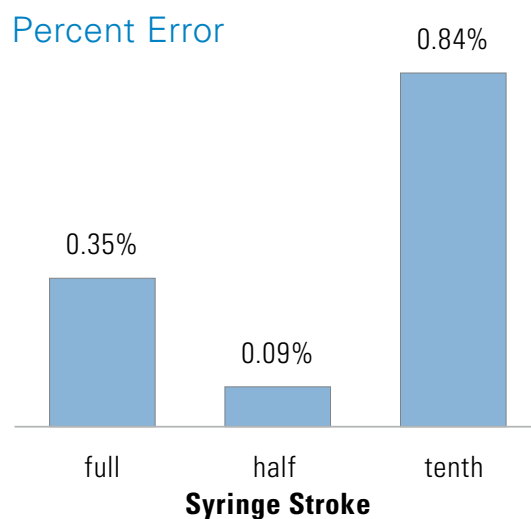

Laboratory Benefits

- Save labor and free up personnel
- Eliminate inconsistent manual pipetting
- Intuitive and flexible software
- Mobile, offline dilution system for the whole lab
- Serving multiple techniques and markets:
  - » ICP, ICP-MS, AA, IC, FIA and more
  - » Environmental, soils, mining, clinical, pharmaceuticals...

TELEDYNE
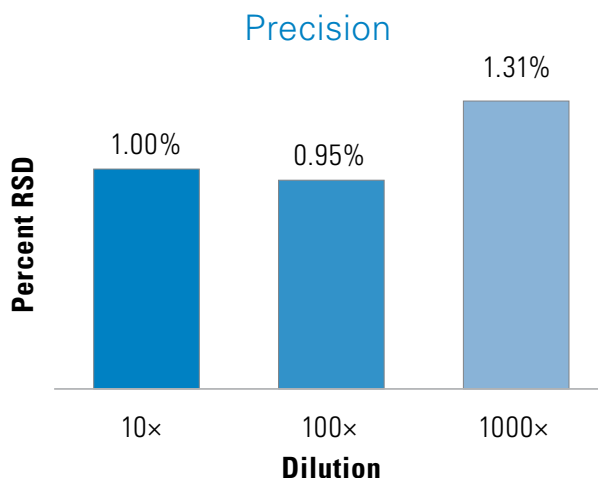**CETAC TECHNOLOGIES**
Everywhere**you**look™

SimPrep Data Quality

Data quality for automated pipetting systems can be broken into three basic metrics. They are accuracy, precision and carryover.

Percent Error

Accuracy – The SimPrep excels at delivering the promised amount to the promised location. A wide range of syringes (10 μL to 50 mL) are offered, which allows you to tailor the setup to get the best results for a wide array of different applications. This specialization allows you to perform anything from dilutions to dispensing while staying within 1% of the target volume.

Percent Error chart (Syringe Stroke):
- full: 0.35%
- half: 0.09%
- tenth: 0.84%

Precision

Precision – It is not enough to hit the target once; the SimPrep hits the target every time. Variations from sample to sample can lead to serious problems for any analysis. This is a particular challenge with hand pipetting, and one that is removed by the automation provided in this system. In the figure at right you can see the data summarized from three sets of 10 replicates at different dilution levels.

Precision chart (Percent RSD vs Dilution):
- 10×: 1.00%
- 100×: 0.95%
- 1000×: 1.31%

Carryover – The carryover of the SimPrep system was tested by analyzing a blank solution (1:10 dilution) that was prepared directly after a 10 ppm standard (made from a 100 ppm stock). This was compared with an undiluted blank solution to quantify the carryover from the preparation step.
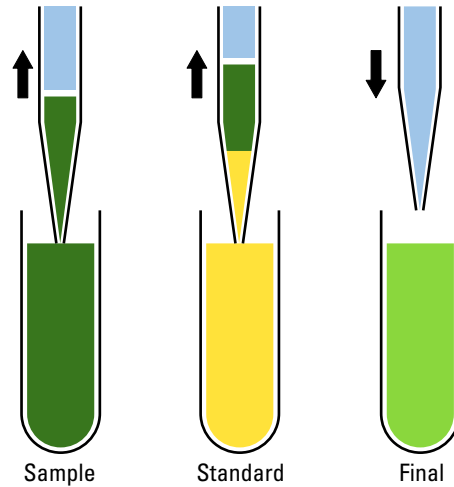
Element		Carryover (%)	Element		Carryover (%)
As	188.979	0.0022%	Mo	202.031	0.0005%
Cd	228.802	0.0036%	Ni	231.604	0.0027%
Co	228.616	0.0004%	Pb	220.353	0.0037%
Cr	267.716	0.0013%	Sb	206.836	0.0083%
Cu	327.393	0.0055%	Ti	334.940	0.0004%
Fe	238.204	0.0025%	Tl	190.801	0.0001%
Mg	285.213	0.0023%	V	290.880	0.0010%
Mn	257.610	0.0007%	Zn	206.200	0.0047%

SimPrep Utility

The SimPrep does much more than simply dilute samples. The intuitive software and dual syringes allow it to achieve a wide range of functions. A few of these functions are highlighted below:
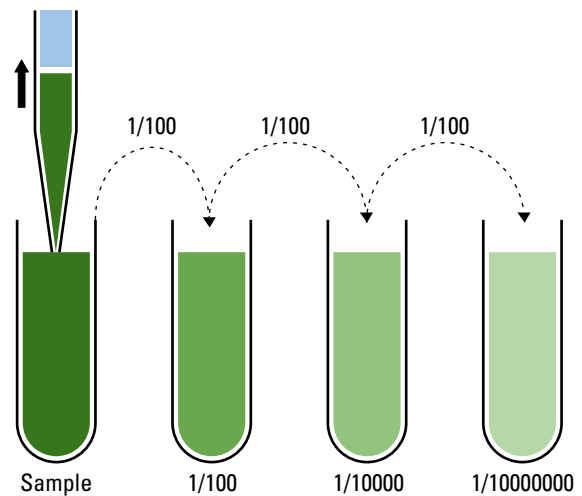
Standard Addition – The software allows the user to add standard solutions for a number of different applications. No matter whether it is a sample spike or a 1:1:10 dilution, the SimPrep makes it easy.

- Matrix spikes
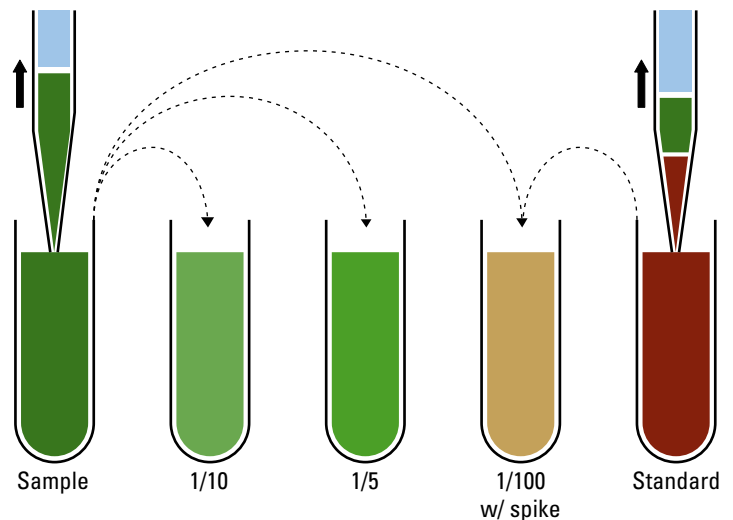- Internal standard addition
- Prepping calibration curves

Sample   Standard   Final

Serial Dilution – Programmable rinsing and mixing options make it easier than ever to do accurate and simple serial dilutions.

- High concentration sample
- High matrix sample

1/100   1/100   1/100

Sample   1/100   1/10000   1/10000000

Splitting – The same sample can be prepared several different ways. This is perfect for customers who want to prep not only for ICP-MS, but for AA and IC as well.

Sample   1/10   1/5   1/100 w/ spike   Standard

SimPrep Automated Liquid Handling Station

The SimPrep is more than just a diluting and dispensing tool; it can automatically create:

- Calibration curves
- Splitting (prep 1 sample 3 different ways)
- Matrix spikes
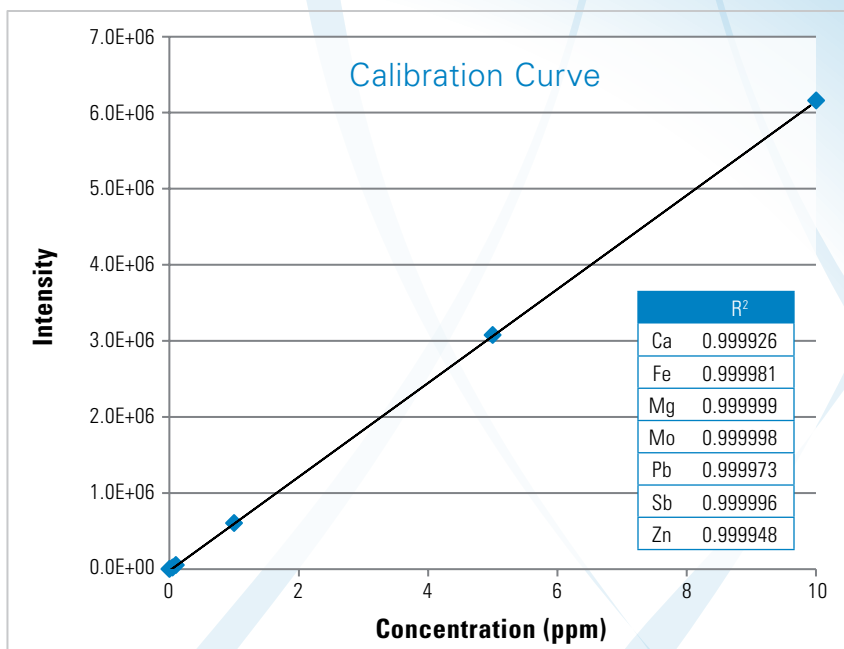- Internal standard additions
- Serial dilutions

Typical Results

- Carryover < 0.01%
- Precision 100% at < 0.2%
- Accuracy 100% ± 1%

Reproducibility

	RSD		RSD
Ca	0.577%	**Mn**	0.688%
Cd	0.356%	**Mo**	0.347%
Co	0.407%	**Sb**	0.804%
Cu	0.524%	**Se**	0.859%
Fe	0.410%	**Ti**	0.713%
Mg	0.672%	**Zn**	0.575%

Replicate RSDs for 10× dilution

Calibration Curve

	R^2
Ca	0.999926
Fe	0.999981
Mg	0.999999
Mo	0.999998
Pb	0.999973
Sb	0.999996
Zn	0.999948

***Standard Preparations** –* The SimPrep can prepare the entire curve from a single stock solution. This brings a high level of precision and accuracy to the most important prep of the day. Don't worry about the analyst on duty or the day of the week, get the same prep every time. *Autocalibration data from a 6 point curve. Standards prepared from a 100 ppm stock at 10× to 2000× dilution.*

Technical Specifications

Autosampler Dimensions

	ASX-560	ASX-280
Height*	62 cm (24.4")	62 cm (24.4")
Width	58 cm (22.5")	35.5 cm (14")
Depth	55 cm (21.6")	55 cm (21.6")
Weight	11.7 kg (26 lbs)	8.1 kg (17.8 lbs)

*with sample probe

Dilution Module Dimensions

Height	26.7 cm (10.5")
Width	14 cm (5.5")
Depth	17.8 cm (7")
Weight	5.9 kg (13 lbs)

Syringe Sizes

10 µL	25 µL	50 µL	100 µL	250 µL	500 µL
1.0 mL	2.5 mL	5.0 mL	10.0 mL	25.0 mL	50.0 mL

Rack and Vial Options

90 × 7 mL | 60 × 4 mL | 40 × 20 mL | 24 × 30 mL | 21 × 50 mL

Available on 2 or 4 rack autosamplers

Power Requirements

100-240 VAC, 47-63 Hz, 1.9 A

Computer Requirements

Microsoft Windows® 7 or higher

Optional Accessories

ENC DC series autosampler enclosures; Mobile cart

Warranty

2 years