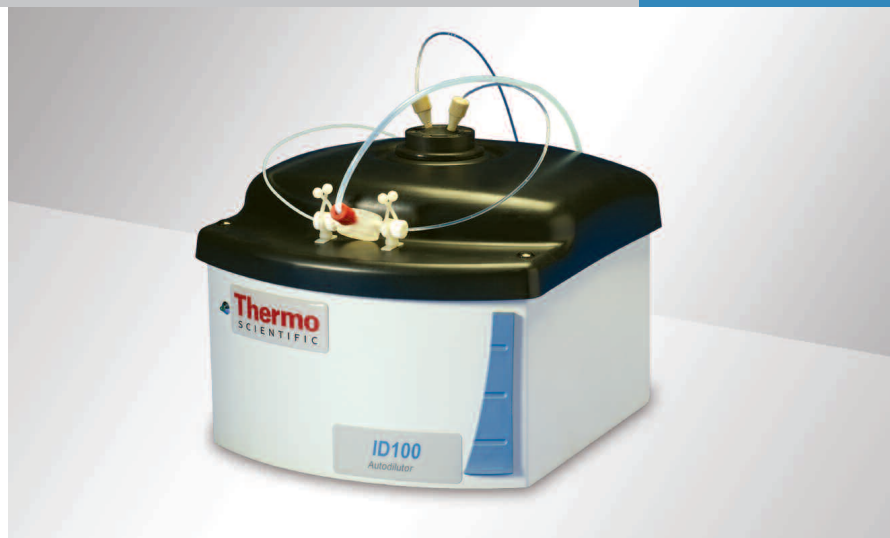


**The Thermo Scientific ID100 Flame Autodilutor System is a significant advance in automated sample dilution and calibration standards preparation, providing high accuracy and increased productivity.**

## ID100 Autodilutor System

A totally automated in-line dilutor and standards preparation system for the iCE 3000 Series range of AA Spectrometers.



Solution-based spectrometric elemental analysis techniques require the preparation of standard solutions to calibrate the spectrometer for each analysis. For Flame Atomic Absorption Spectrometry (FAAS), at least three calibration standards are needed to accurately track the calibration graph curvature.

Preparation of these calibration standards is one of the more time-consuming activities in most analytical laboratories. Standards preparation frequently involves multiple dilution steps, increasing the risk of contamination and operator errors.

A consequence of FAAS calibration curvature is that the dynamic concentration range of the instrument is relatively short, so real sample concentrations may lie above the top standard and the linear region of a calibration. The user then has to pause the

analysis and dilute the over-range sample(s) until they lie within the calibrated range.

This is no longer necessary, since the Thermo Scientific ID100 Autodilutor has been designed to take over these labour-intensive tasks. It can automatically prepare working calibration standards from a single master standard so that no manual dilution steps are required. It also simplifies the task of handling over-range samples by intelligently diluting them into the calibration range. Full automation is possible by combining the ID100 with any of the AA Flame Autosamplers.

The system uses an extremely accurate, multi-piston pump to control the flow rate of the undiluted solution to a mixing point where it is mixed with diluent. Samples are only ever in contact with chemically inert materials.

## Dilution Range

The ID100 Autodilutor provides dilution ratios of up to 100x when used with a Thermo Scientific Atomic Absorption instrument. It will work with all types of sample that are suitable for measurement by Flame AA spectrometry.

## Functions

Up to ten working standards can be prepared from a single master standard, with a maximum dilution of up to 100x.

Sample solutions can be diluted by a previously specified, fixed ratio (up to 100x) before they are measured. The Corrected Concentration (CC) result will take into account the dilution, and will report the concentration result found for the undiluted sample.

When used with the SOLAAR software, over-range samples can be detected and automatically diluted to bring the measured signal in to the range covered by the calibration graph. The Corrected Concentration result will again take into account the dilution, and will report the concentration result found for the undiluted sample.

## Configurations

The ID100 Autodilutor accessory is compatible with all flame versions of the iCE 3000 Series AA Spectrometers. It may be used with manual sample preparation, or with any of the Thermo Scientific range of Flame AAS Autosamplers.

## Operation

The Autodilutor uses a stepper motor-controlled multi-piston pump to provide highly accurate and reproducible control of the sample solution flowrate, thus ensuring accurate dilution and consistent day-to-day performance. The pumped solutions contact only Teflon, PEEK and sapphire.

## Speed

When used with an autosampler and default measurement parameters, the Autodilutor can typically generate a 5-point calibration in 3 minutes (from the end of a blank measurement to the end of a top standard measurement).

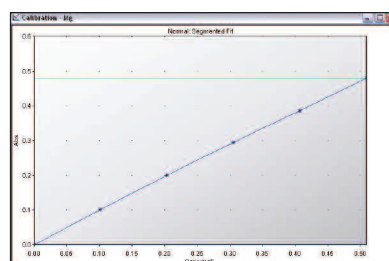


Figure 1: Master standard 0.5 ppm

## Accuracy

Figures 1 and 2 show two calibration graphs measured for the same element. Figure 1 was prepared automatically from a 0.5ppm master standard. Figure 2 was prepared over a similar concentration range, but from a 50.0 ppm master standard. The dilution ratios were therefore 100x greater. For the left hand graph, the CC is 0.0044, while for the right hand graph, measured with 100x greater dilution, the CC is 0.0045. A skilled and experienced analyst would have to perform their dilutions very carefully indeed to improve on this performance!

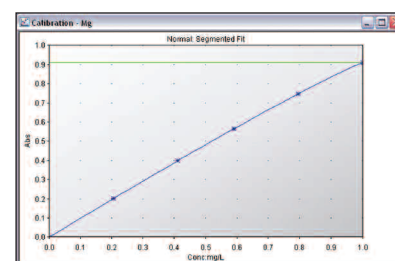


Figure 2: Master standard 50 ppm

## Dilution Performance

Dilutions of up to a factor of 100 may be used. Typically, the measurement precision is within the range 1 - 3% RSD, at all dilution ratios. The dilution error (measured as the % deviation from nominal) is typically +/- 2% at the 100-fold dilution rate. Some typical results are shown in Table 1.

ACTUAL CONCENTRATION	MEASURED CONCENTRATION	DILUTION RATIO	PRECISION (RSD)	DILUTION ERROR
2.527 mg/L	2.498 mg/L	8x	1.1%	- 1.2%
5.034 mg/L	4.987 mg/L	20x	0.6%	- 0.9%
10.27 mg/L	10.22 mg/L	100x	1.4%	- 0.5%

Table 1: Typical results for automated dilutions