



Agilent Autodilutor for ICP-OES and ICP-MS Instruments

Less work. More flow.

Why all-Agilent?

Installing an Agilent autodilutor instead of one from a third party offers several advantages, including:

- Full-integration. There's no third party involved.
- Optimized for Agilent ICP
- Designed to work as one system, with all settings included in the method and advanced features that can only be achieved when software and hardware are designed as one.
- Simpler purchasing process and faster product support from a single point of contact
- Requires less staff training with only one software platform to learn
- Contains no surprises. The system is tested to Agilent's strict QC requirements.

The Advanced Dilution System (ADS 2)

Designed and manufactured by Agilent, the Advanced Dilution System (ADS 2) integrates with Agilent ICP-OES and ICP-MS instruments. The combination of the instrument, autodilutor, switching valve, and autosampler offers the highest level of automation of ICP analyses. The ADS 2 is especially useful for labs that run routine analyses of large numbers of varied samples where the concentrations of the analytes can vary significantly.

The autodilutor automates all common dilution tasks, including:

- Autocalibration of the ICP by preparing calibration standards from a stock
- Prescriptive dilution of samples before measurement
- Reactive dilution and remeasurement of overrange samples
- Reactive dilution after internal standard or QC failure

Control of the autodilutor is an integral part of the instrument software (both ICP-OES and ICP-MS). Like the autosampler and switching valve, the autodilutor settings form part of the method.

Simple and quick inline dilution

The ADS 2 is an *inline* autodilutor. The diluent is added to the sample solution as it flows through the tubing to the instrument. This design outperforms manual or automatic offline dilution, which requires taking an aliquot from the sample tube, depositing it into an empty tube, and then adding diluent.

Inline dilution is much faster than offline dilution. It also reduces the risk of sample contamination, as no additional tubes are required for sample analysis. With the Agilent ADS 2 autodilutor, samples that don't require dilution bypass the autodilutor and are loaded into the switching valve for analysis by the ICP. This design ensures fast sample analysis times when dilution is not necessary, maximizing sample throughput.

Key features of the ADS 2

Custom reactive dilutions for each sample

During the measurement of a batch of samples, a sample may need dilution due to its concentration being outside the calibrated range. This is a 'reactive' dilution. Using the 'Dilution Lists' function, you can setup reactive dilutions to be done only when specific elements in a sample are over-range. This avoids unnecessary dilutions triggered by a high level of any element, for example, sodium in brine samples. Having this precise level of control over reactive dilutions reduces sample consumption and increases sample throughput.

Automatic combination of the best results for each element

The 'Results Summary Report' feature automatically checks if a result is within the calibration range and an acceptable internal standard range. The optimal results for each element in a sample are selected and presented—from all the measurements taken (Figure 1). The feature simplifies data review and frees up your skilled analyst's time. You can export this data set, or all data, to a LIMS, with all data retained for integrity purposes.

Solution Label	Al 237.312 nm mg/L	As 188.980 nm mg/L	Ba 455.403 nm mg/L	Fe 238.204 nm mg/L	Fe 239.563 nm mg/L
Summary	538.80	0.41	6.62	897.20	849.50
Original	497.65 o	0.41	6.62	758.60 o	736.63 o
Dilution -10	53.88	0.04	0.76	89.72	84.95

Figure 1. The Results Summary Report combines the best results for each element from all measurements taken of a sample.

Adding an autodilutor to an existing ICP

Your Agilent ICP-OES running ICP Expert version 7.7 or later, or your ICP-MS or ICP-QQQ running ICP-MS MassHunter version 5.3 or later can be integrated with an ADS 2.

Any autosampler listed in the instrument control software is suitable for use with the autodilutor.

For more information visit:

www.agilent.com/chem/icp-automation

This information is subject to change without notice.

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Key benefits

Automating your ICP system by incorporating an ADS 2 offers:

- Improved data quality with consistent, automated dilutions
- Increased revenue from higher sample throughput
- One analysis—no reruns, data reported on the same day
- Less sample handling and contamination
- Reducing labware—vials and pipettes
- Staff can concentrate on more value-adding tasks

Application notes

Examples of analyses using the autodilutor as part of an ICP automated system include:

Intelligent analysis of wastewaters using an Agilent ICP-MS with integrated autodilutor, [5994-7113EN](#)

Automated analysis of low-to-high matrix environmental samples using a single ICP-MS method, [5994-7114EN](#)

Productive analysis of high matrix samples using ICP-MS with Advanced Dilution System, [5994-7232EN](#)

Automating the workflow for the analysis of soils by ICP-OES, [5994-7203EN](#)

Determination of multiple elements in lithium salts using autodilution with ICP-OES, [5994-7179EN](#)

ICP-OES quality control of elements in brines produced by Direct Lithium Extraction (DLE), [5994-8041EN](#)