INCREASED SENSITIVITY WITH MINIMAL BLOCKAGE

The Measure of Confidence

OneNeb Nebulizer From Agilent

Based on Flow Blurring nebulization technology, the revolutionary OneNeb nebulizer from Agilent generates a fine aerosol that improves both sensitivity and tolerance to dissolved solids for ICP-OES and MP-AES applications. Its inert construction stands up to all samples – including strong acids such as hydrofluoric acid (HF) and common organic solvents – with efficient operation across normal and micro flow rates. Other advantages include:

- **Ultimate flexibility.** Eliminate the hassle of using different nebulizers for –
  - routine samples
  - "high solids" samples
  - volume-limited samples
  - samples prepared in aggressive acid digests

  Operate the OneNeb nebulizer over a wide range of solution flow rates (from 0.04 to 2.0 mL min^{-1}) without sacrificing sensitivity.
- **Inertness and robustness.** Polymeric (PFA and PEEK) construction makes OneNeb suitable for virtually any sample including common organic solvents used in the petrochemical industry – as well as sample digests from geochemical fusions prepared in aqua regia, HF or four-acid digests ($HClO_4$ - HCl - HNO_3 - HF).
- **Easy to use.** Compatible with most conventional glass cyclonic and inert spray chambers. Simply replace your existing concentric glass nebulizer with the OneNeb nebulizer. No other method changes are required.
- **No special maintenance.** Simply rinse with your rinse solution when your analysis is complete.

OneNeb

10 reasons to replace your current nebulizers with the OneNeb nebulizer from Agilent

1. A single OneNeb can replace several nebulizers
2. Inert: use with virtually any solution type
3. Virtually indestructible – even when accidentally dropped
4. High efficiency improves sensitivity and detection limits
5. Delivers outstanding precision: typically < 1-% RSD
6. Excellent long-term stability
7. Minimal blockages with high-dissolved solids
8. Flow Blurring technology
9. Easy to use – just replace your existing nebulizer
10. One supplier for all your spectroscopy needs

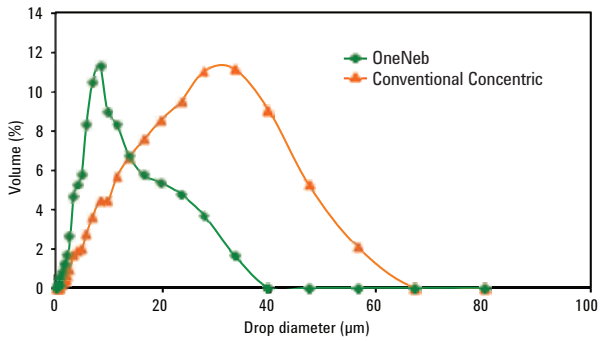
Agilent Technologies

Conventional nebulizers cannot deliver the performance improvements of the OneNeb nebulizer

Improved precision and sensitivity

The Flow Blurring technology used by the OneNeb nebulizer creates a fine aerosol with a narrow size distribution, and the majority of droplets sized < 10 µm. This ensures optimal sample transport for enhanced precision. Sensitivity is also increased up to two times, even with low sample flow rates.

Liquid uptake rate = 1.0 mL/min
Gas flow rate = 0.70 L/min



The OneNeb nebulizer (green) creates an aerosol with smaller droplets and a narrower size distribution than a conventional Conikal nebulizer (orange). This ensures better precision and improved sensitivity.

Lower detection limits

Because the fine aerosol is more efficiently desolvated and excited in the plasma, the OneNeb nebulizer delivers robust performance with lower detection limits. What's more, the typical precision achieved with the OneNeb nebulizer is less than 1% RSD.

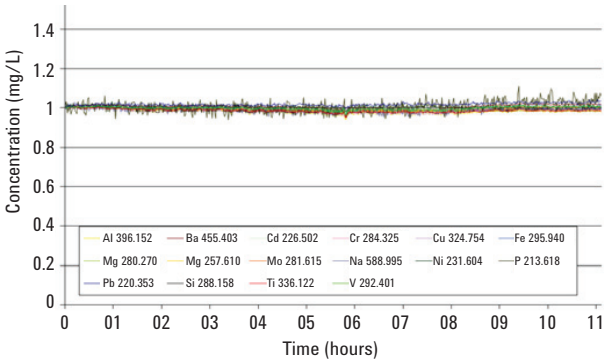
Element	CGN DL	OneNeb DL	DL ratio (%)
Ag 328.068	0.61	0.61	100
Al 167.019	1.94	1.53	127
As 188.980	12	9.84	122
Ba 455.403	0.07	0.05	162
Be 313.042	0.01	0.01	193
Ca 396.847	0.09	0.07	121
Cd 214.439	1.27	0.91	139
Co 238.892	1.9	1.7	110
Cr 267.716	0.86	0.7	123
Cu 327.395	1.76	0.96	183
Fe 238.204	0.9	0.68	132
K 766.491	59	38	154
Mg 279.553	0.05	0.05	107
Mn 257.610	0.19	0.15	131
Na 589.592	2	1.04	197
Ni 231.604	5	5	108
Pb 220.353	12	10	113
Se 196.026	17	13	133
Tl 190.794	15	12	129
V 292.401	1.24	0.96	129
Zn 213.857	0.5	0.49	101

This chart compares the radial ICP-OES detection limits achieved with the OneNeb nebulizer against those achieved with a concentric glass nebulizer (CGN) using a 30 second integration. The OneNeb nebulizer provided superior detection limits for most elements.

For additional data examples, consult Agilent Application Note 5990-8340EN: *Evaluation of A Novel Nebulizer Using an Inductively Coupled Plasma Optical Emission Spectrometer*

Superior TDS tolerance and long-term stability

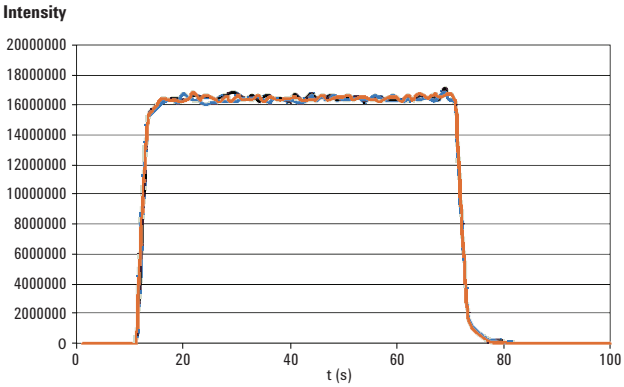
The OneNeb nebulizer is highly tolerant of dissolved solids, so you can easily run samples that might induce blockage with conventional nebulizer designs. These include samples such as estuarine waters, brines, and fine chemicals that can contain up to 25% total dissolved solids (TDS). In addition, the OneNeb nebulizer is highly stable over long-term measurements, with excellent chemical resistance.



Excellent chemical resistance: *Here you can see proof of the OneNeb nebulizer's long-term stability – even during continuous aspiration of ShellSol (low aromatic, inert hydrocarbon solvent).*

Increased sample throughput and accuracy

For running solutions with high dissolved solids, the OneNeb nebulizer provides washout characteristics that are equal to or better than conventional nebulizers.

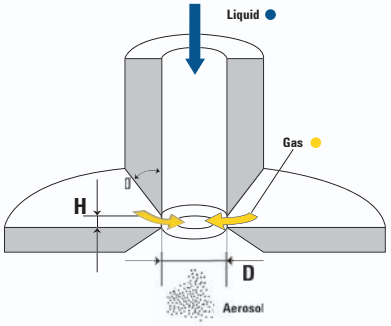


Washout profile for 25 ppm Mn in 1% nitric acid using the single-pass glass cyclonic spray chamber (3 replicates).

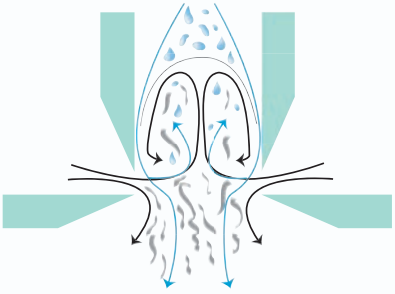
Why Flow Blurring Nebulization?

Flow Blurring is the most reliable and efficient technology for pneumatic atomization. Conventional nebulizers rely on the venturi effect to produce an aerosol as the argon flow is forced through the tip past the narrow bore inner sample capillary. The narrow sample capillary makes it prone to blockages – especially with samples containing high levels of dissolved solids.

Flow Blurring nebulization employs highly turbulent mixing between the nebulizer gas flow and the sample. With no pressure drop and a constant diameter capillary, nebulizer blockage is virtually eliminated. This technique creates an aerosol with extremely fine micro- and nano-scale droplets. It is also compatible with virtually any liquid, and can handle a wide range of solution flow rates.



The Flow Blurring nozzle configuration promotes highly turbulent mixing between the liquid sample and the nebulizer gas flow – creating a fine aerosol of extremely small droplets.



Turbulent mixing between a liquid (blue) and gas (black).

To learn more, visit **www.agilent.com/chem/OneNeb**

OneNeb ICP-OES Nebulizer Specifications

Configuration	Pneumatic concentric nebulizer
Material	High-tech PFA and PEEK polymer
Body	Standard 6 mm od fitting; directly interchangeable with standard concentric nebulizers
Sample solution tubing	FEP natural, 1 mm od, 0.5 mm id
Nebulizer gas connector	Quickfit connector
Solution uptake range	• 0.04-2.0 mL min^{-1}, allowing the analysis of volume limited samples – *Sample solutions must be pumped to the nebulizer, as the OneNeb will not self-aspirate any solution*
Compatibility	• Suitable for most conventional glass cyclonic and inert spray chambers • Use cyclonic spray chamber for optimal performance
Typical applications	• Samples with high total dissolved solid levels (up to 25%) • Samples with large particle sizes (up to 75 µm diameter) • Acidic and organic solutions • Good performance with limited-volume samples using very low solution uptake rates

Ordering Information

Make Agilent your full-source supplier of spectroscopy supplies.

Description	Part number
OneNeb inert concentric nebulizer for HF digests, high TDS samples, and organic solvents. Includes snap-on connector for nebulizer gas inlet	2010126900
Application Kits for Agilent Axial ICP-OES Systems	
Double-pass glass cyclonic spray chamber, mounting bracket, OneNeb inert concentric nebulizer, and transfer tube	9810046590
Single-pass glass cyclonic spray chamber, mounting bracket, OneNeb inert concentric nebulizer, and transfer tube	9810046690
Application Kits for Agilent Radial ICP-OES Systems	
Inert Sturman-Masters double-pass cyclonic spray chamber, mounting bracket, OneNeb inert concentric nebulizer, and transfer tube	9810046390
Double-pass glass cyclonic spray chamber, mounting bracket, OneNeb inert concentric nebulizer, and transfer tube	9810046490

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