

Ease of Use

The HTS is fully integrated with the NexION series of ICP-MS and the Avio series of ICP-OES and is controlled by Syngistix™ software. This integration eliminates additional complex software interactions and enables users to benefit from controlling all system parameters using one software platform. With such simplicity, users can now focus on what matters most – productivity.

Extended Stability and Reduced Maintenance

The HTS increases instrument stability and reduces maintenance by reducing the sample volume introduced into the instrument: only the amount required for analysis enters the instrument, with any extra sample being directed to waste. This significantly reduces the matrix load on the instrument front-end, thus minimizing possible build-up on the nebulizers tip, torch, injector and cones (ICP-MS only). As a result, instrument front-end maintenance is significantly reduced, and stability is remarkably improved.

Excellent Reliability and Precision

The metal-free path of the HTS is reliable and corrosion-resistant, as demonstrated by the analysis of several high concentration acids over 8 hours. These tests showed excellent short and long-term precisions of < 1% in the acids shown in Table 1. Thirty thousand cycles are equivalent to approximately 6 months of use in a high throughput laboratory environment. To maintain high performance, valve inspection and cleaning is recommended every six months.

The HTS delivers improved throughput without compromising data precision. Table 2 compares the precision of the data obtained with and without the HTS, showing a variance between the RSDs of the isotopes used for EPA method 200.8, ranging from 0-1.4%.

Table 1. Chemical Compatibility and Reliability.

	Test Type	W/O Valve	10K Cycles	30K Cycles
Aqua Regia 20%	Precision	✓	✓	✓
	Stability (8hrs)	✓	✓	✓
Sulfuric Acid 20%	Precision	✓	✓	✓
	Stability (8hrs)	✓	✓	✓
Nitric Acid 20%	Precision	✓	✓	✓
	Stability (8hrs)	✓	✓	✓

Table 2. Comparison of precision for the analytes in EPA Method 200.8: Standard Sample Introduction vs. HTS for a 10 µg/L Standard.

Elements	% RSD with Standard Sample Introduction	% RSD with HTS	Elements	% RSD with Standard Sample Introduction	% RSD with HTS
⁹ Be	1.1	0.7	⁹⁸ Mo	1.9	1.3
²⁷ Al	0.9	0.6	¹⁰⁷ Ag	1.4	1.4
⁵¹ V	0.8	1.3	¹¹¹ Cd	0.9	0.8
⁵² Cr	0.8	1.1	¹²¹ Sb	0.9	1.1
⁵⁵ Mn	1.0	0.7	¹³⁷ Ba	1.1	0.6
⁵⁹ Co	1.0	0.6	²⁰⁵ Tl	0.6	0.4
⁶⁰ Ni	1.0	0.9	²⁰⁸ Pb	0.5	0.3
⁶³ Cu	0.5	0.8	²³² Th	0.5	0.3
⁶⁶ Zn	0.6	0.7	²³⁸ U	0.3	0.6
⁷⁵ As	0.8	1.1			

Summary

The High Throughput System is fully integrated with the NexION series of ICP-MS and the Avio series of ICP-OES instruments to maximize productivity by increasing sample throughput more than three-fold without compromising analytical performance. In addition, the HTS improves ease of use while minimizing instrument maintenance to provide a more cost-effective solution for elemental analysis.

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