

Flow Solution 3700

Automated Chemistry Analyzer

Automating Wet Chemistry for

Flow Solution™ 3700

For years, laboratories have turned to OI Analytical for accurate, reliable continuous flow analyzers. Our next generation of flow instrumentation features game-changing technology that significantly improves laboratory workflow, making the Flow Solution 3700 Automated Chemistry Analyzer the most efficient, flexible, and easy-to-use system available for automated wet chemistry analysis.

Perform 30-90 analyses per hour, per channel

Automate sample preparation and analysis of USEPA, ASTM, ISO, DIN or in-house QA/QC methods

Save time and money by automating digestion, distillation and/or dialysis

Use any combination of SFA, FIA, iSFA and/or sFIA methods with a variety of detectors

Versatile single platform for regulatory monitoring, QA/QC, and research

Intuitive FlowView software provides powerful data analysis capability



Advanced Technology for Superior Performance

Flexible, Modular Design

The unique, modular design of the FS 3700 gives the system superior flexibility. Different flow methods, including SFA (segmented flow analysis), FIA (flow injection analysis), iSFA and sFIA can be run on different channels on the system simultaneously. A variety of pre-configured chemistry cartridges and industry-leading detectors can be utilized with plug-and-play ease. Multiple systems can be linked to provide additional channels of concurrent analysis.

Validated Methods

OI Analytical validates the hardware configuration and performance of every method supplied with the FS 3700 analyzer, providing users a total analysis solution. Methods for aqueous samples, soil or plant extracts are available to support environmental compliance monitoring, process optimization and research applications.

Ammonia, Chloride, Cyanide, Fluoride, Nitrate, Phenol, Phosphorous, Silica, TKN, and more!

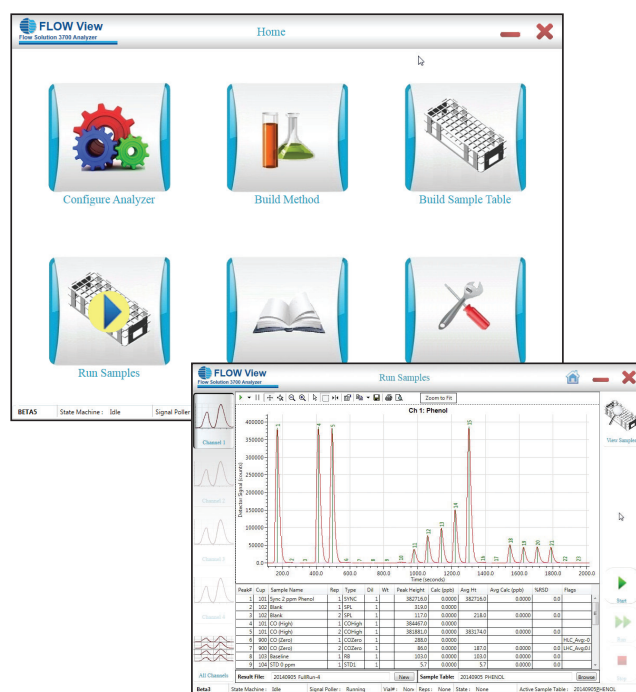
Laboratory Productivity

Powerful Software Capabilities

FlowView™ Software

The intuitive FlowView software is unparalleled in competitive systems. Designed for 32- or 64-bit Windows® operating systems, FlowView's improved user interface streamlines scheduling, operation and report generation from the FS 3700. The icon-driven user-interface simplifies navigation and helps new users quickly become proficient.

- On-the-fly sequence editing and calibration monitoring
- LIMS-compatible import/export with user-friendly, customizable report generation
- New, refined algorithms for peak detection, baseline handling, and carry-over correction
- System configuration and method parameters are archived with the data in each result file
- Unparalleled access to instrument component diagnostics in real-time, even during data collection



Versatility with Plug-and-Play Ease

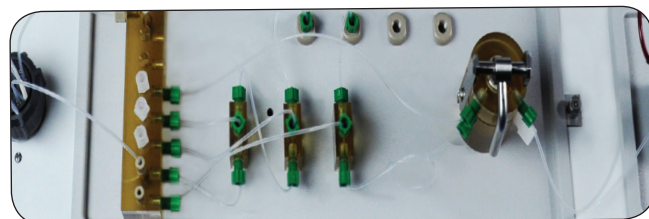
Interchangeable Chemistry Cartridges

The FS 3700 utilizes interchangeable, pre-assembled chemistry cartridges for maximum versatility and ease of use. Each chemistry cartridge is configured with all of the components needed to perform each validated analysis method. Just attach the pump tubing and detector flow cell and you are ready to go. The FS 3700 runs up to 2 channels simultaneously, each with its own cartridge, with additional channel configurations available. Modular, flexible hardware provides a great platform for research, in-house or proprietary methods.

Plug-in Detector Modules

The FS 3700 comes standard with two detector boards, each capable of supporting photometric, amperometric, ion-selective electrodes and third-party detectors out of the box. This provides additional flexibility to tailor methodology for research or quality control processes while utilizing fluorescence, flame photometric or other detectors. Refinements in detector design have improved signal-to-noise ratio and doubled sensitivity.

The Expanded Range™ photometric detector and auto-scaling software virtually eliminate off-scale samples. Calibration curves can span four orders of magnitude, providing accurate results the first time – without the need for additional injections or an autodilutor.



- In-line heating/UV digestion programmable in 1 °C increments
- Automated injection valves minimize noise and pressure fluctuations
- Magnetic mixing tees - move them as best fits your configuration
- Unattended start-up and shut-down
- Leak detection (user definable action)

FS 3700 Specifications

Analysis Module	1 or 2 chemical analysis channels per chassis
Analysis Module Dimensions	31 in. W x 17.5 in. D x 10.5 in. H 78.74 cm W x 44.45 cm D x 26.67 cm H
FS 3700 Dimensions with 90-position Autosampler	Approximately 44 in. (112 cm) W
FS 3700 Dimensions with 360-position Autosampler	Approximately 51.5 in. (131 cm) W
Injection Valve	8 or 10-port switching valve with chemically-inert wetted surfaces
Photometric Detector	420-880 nm, with PEEK path lengths of 5-, 10- or 20-mm
Amperometric Detector	Silver working electrode, silver/silver chloride reference, stainless steel counter electrode
In-line Heater	Included as needed, mounted underneath chemistry cartridge, user programmable in 1 °C increments
UV-digestion Module	Included as needed, mounted underneath chemistry cartridge
Peristaltic Pump	24-channel, fits on top of analysis module
Autosampler	90-position, X-Y-Z (90 samples + 9 standards) 360-position, X-Y-Z (360 samples + 10 standards)
Tubing	FEP Teflon® and EVA ethylene-vinyl acetate copolymer
Manifolds / Fittings	Polysulfone
Analysis Methods / Documentation	Validated chemistries for specific analytes/sample matrices with performance data
Operating Software	FlowView
Operating System	Windows® 7, Windows® 8, 8.1 and 10
Data Collection	6 channels per instance of software Multiple instances of software can be run on a single computer
PC to FS 3700 Communications	USB
Power Supply	24VDC universal switching power supply for operation with 90-250VAC 50/60Hz source
Power Requirements	110VAC/60 Hz or 230VAC/50 Hz
Weight (Analysis Module)	19.5 kg (43 lbs.), typical for analysis module and pump, two injection valves, chemistry cartridges, detector modules
Certifications	CE Safety EN 61010-1 EMC Immunity & Emissions EN 61326-1:2006



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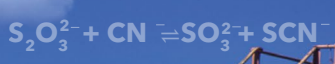
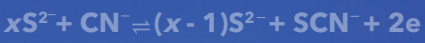


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xylem



CNSolution™ 9310 Online Cyanide Analyzer

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O·Analytical 
a xylem brand

CNSolution™ 9310

Accurate measurement of cyanide in leaching solutions



Accurately measuring cyanide available for leaching precious metal ores containing copper and metallic sulfides is problematic. Copper complexes with cyanide, reducing the cyanide available for leaching. Titration methods commonly used for process control in gold leaching poorly estimate the amount of cyanide available when copper is present.¹ Other reaction products including thiocyanate, nitrate, nitrite, ammonia, and sulfur (IV) oxides interfere with most cyanide analysis methods.²



The OI Analytical CNSolution 9310 Online Cyanide Analyzer is designed to measure available cyanide in precious metal leaching solutions by U.S. EPA Method OIA-1677³, a method developed by chemists at OI Analytical in conjunction with the University of Nevada-Reno Mackay School of Mines, and ASTM D 6888-09⁴.

The gas-diffusion amperometry technique in these methods has been demonstrated to be free of interferences from copper and metallic sulfides in precious metal leaching solutions.⁵

The system features Teflon® tubing and a simple plumbing configuration, which makes walk up sampling easy and straightforward. The CNSolution 9310 is the easiest-to maintain online cyanide analyzer.

Online monitoring with the CNSolution 9310 enables gold and silver mills to reduce both cyanide consumption and the operating costs associated with the cyanidation process.

CNSolution 9310 Deployment in Precious Metal Cyanidation

The CNSolution 9310 supports the measurement and control of cyanide in multiple cyanidation unit operations as shown in this process diagram.

1. Cyanide Addition
2. Leaching
3. Cyanide Recycle
4. Detoxification
5. Effluent Discharge/Tailings

Reliable data for process control

In operation, a filtered slurry sample is drawn into the CNSolution 9310 to fill a fixed volume loop. A base reagent is continuously pumped through one side of a gas diffusion module equipped with a hydrophobic membrane and out through the flow cell of an amperometric detector.

Sample in the loop is injected into an acidic carrier stream. The acidic conditions convert CN^- in the sample to hydrogen cyanide (HCN) gas. The HCN gas diffuses across the hydrophobic membrane into the base reagent where it converts back to CN^- and enters the flow cell of

the amperometric detector. Cyanide ions react with the silver electrode and generate a current proportional to the cyanide concentration. The detector response for each sample is displayed in real-time as a peak on the touch-screen display and can be output to a Supervisory Control and Data Acquisition (SCADA) system.

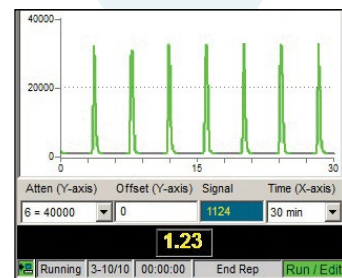
Data can be output to a LAN network in a Microsoft® Excel® - ready .csv format or retrieved using a USB memory stick.



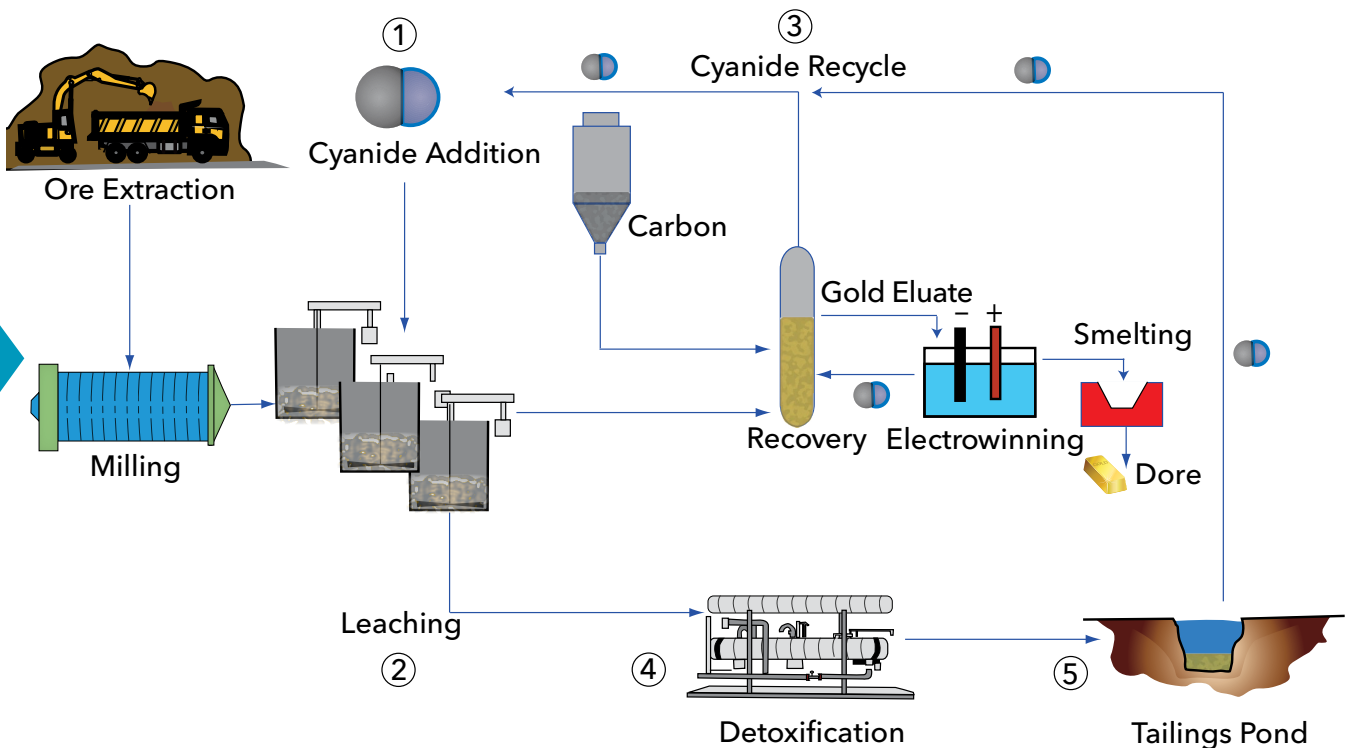
Start/Edit Screen



Run Screen



Detector Response



CNSolution™ 9310 Specifications

Operating Principle	FIA by gas diffusion amperometry
Measurement Technique	Amperometric detection - silver electrode
Measurement Ranges	0.2 to 50 / 2.0 to 500 / 20 to 2000 ppm CN
Reference Methods*	USEPA OIA-1677 / ASTM D 6888-09 (Available CN)
Calibration	2 point calibration
Measurement Accuracy	± 5% at 50-ppm
Sample Introduction	Continuous online fill-and-spill sampling system
Sampling Interval	User programmable
Analysis Time	<3 minutes
Operating Environment	5 - 45 °C, up to 90% humidity (non-condensing)
Operator Interface	Windows® CE-based, Color touch-screen display
Reagents Required	Water, NaOH, HCl, CN ⁻ calibration standards
Power Requirements	24VDC
Output Relays	2 (system alarm, sample alarm)
Analog Output	(2) 4-20mA (user-configurable concentration)
Data Export	To PC via Ethernet, or using USB memory stick
Instrument Enclosure	NEMA 4X / IEC Class IP-56
External Dimensions	48.3 cm H x 31.1 cm W x 31.1 cm D (19" H x 12.25" W x 12.25" D)
Weight	11 kg (24 lbs.)

* Free Cyanide ASTM D7237-10 and Total Cyanide ASTM D 7511-12 configurations are available. Contact OI Analytical customer support for information.



CNSolution 3700 Laboratory Cyanide Analyzer

The Lab Solution™ 3700 Laboratory Cyanide Analyzer performs the same gas-diffusion amperometry technique used in the CNSolution™ 9310 for calibration checks and confirmatory testing of grab samples.

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