



ISE-FC

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Flow Cells and Accessories

Robust, Affordable, Reliable

Product Range

Global FIA have developed a range of flow cells and accessories for spectrophotometers and ion selective electrodes. These may be used in conjunction with flow-based analyzers or as standalone devices. Together with the flow cells, there are a range of accessories to simplify your spectrophotometric setup or potentiometric data acquisition.

In designing this range of products we paid careful attention to simplifying our design without sacrificing performance. The result is a range of products with simple clean lines, ease of operation, versatility in configuration and hours of robust data acquisition.

The Bubble tolerant 5cm cell (BTFC-5)

This cell has been carefully designed to easily pass bubbles that may be in your stream.

Anyone that has used flow cells in flowing systems has experienced the frustration of a bubble trapped in the flow cell that destroys all data until it is cleared usually by tapping the side of the flow cell. We have spent hours watching the passage of bubbles through a cell and identified where they are likely to get trapped and how one may efficiently sweep them from the cell minimizing their impact on spectrophotometric data.

This flow cell has a 5 cm path length providing additional sensitivity compared to the standard 1 cm flow cell.

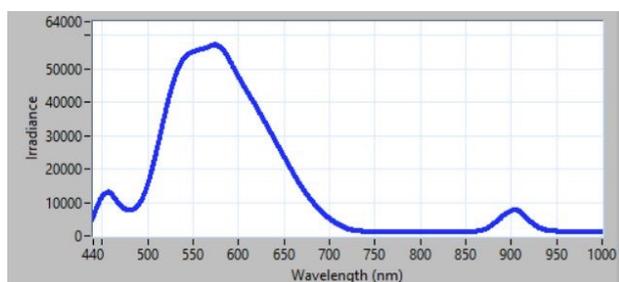
The flow cell comes equipped with a set of quartz fiber optic cables that are terminated with industry standard SMA connectors for coupling to spectrometer and light source. No windows, lenses or delicate optical components are needed. Fluid connection of the 1/16" OD tubing

is by means of miniature 6-40 fittings. The internal volume of the flow cell is $<40 \mu\text{L}$.

The flow cell material is compatible with aqueous streams across the pH.

LED light source (LS-LED)

LEDs have proven themselves as powerful and versatile light sources for spectrophotometric and fluorescence measurements. Both monochromatic LED as well as broad spectrum super bright white LEDs have been used. For some fluorescence measurement high power uv LEDs have been used. The LED light holder is designed to dissipate heat from heat sensitive LEDs or new bright Cree LEDs. Our LED light source is equipped with a convenient SMA connector. The light source is powered with a 24VDC power supply. Light intensity is adjustable. LEDs are exchangeable.



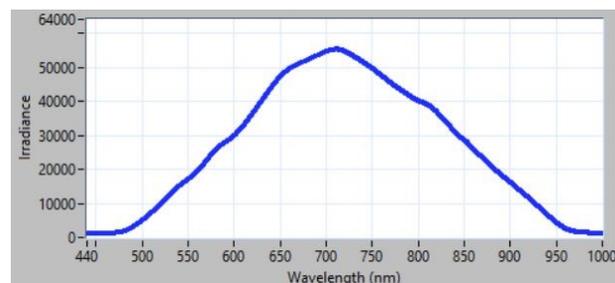
White LED spectrum



LEDs used in LED light source

Tungsten-xenon light source (LS-W)

A miniature tungsten xenon lamp powers this light source which has a similar package to the LED light source. Intensity is adjustable. Lamps are easily exchanged with affordable replacement lamps when they reach their life time.



Tungsten Xenon lamp spectrum

Collimated cell kit (CC-KIT)

Ruzicka has described the Garth cell in his [FIA Tutorial](#)¹. This cell provides a simple design for a long path length cell without the use of liquid core waveguides by collimating the light down a narrow channel. No lenses or other optical elements are used. The light from a single core fiber is aligned with similar diameter fluid channel. The transmitted light is collected at the end of the cell with a similar single core fiber. In this kit we include the end pieces which align the optical fibers with the fluid path and 3 additional intermediate pieces to allow the user to assemble a 5 cm, 10 cm or 15 cm cell in addition to the 1 cm default cell. The kit also includes a pair of fiber optic cables terminated with industry standard SMA connectors.

Collimated cell heater (CC-HTR)

In certain chemistries it is interesting to monitor the progression of chemical reaction in the flow cell by stopping the flow when the reactants are in the flow cell. This approach is described as [SFC mode](#)² (Stop in Flow Cell). The rate of the ensuing reaction can be influenced by the reaction temperature and so a heating element is

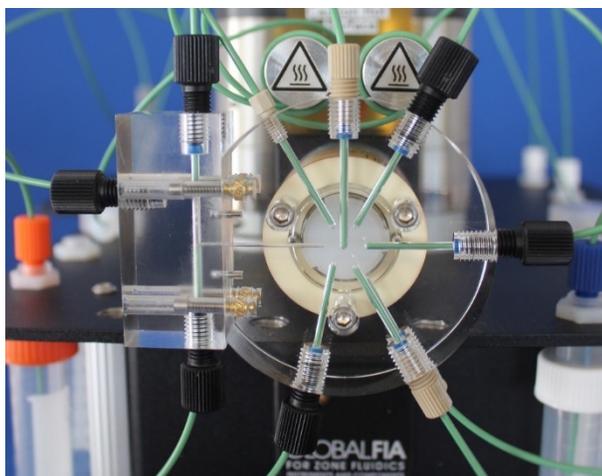
¹ <http://www.flowinjectiontutorial.com/Methods%201.4.12.%20Experimenting%20with%20Garth's%20Cell.html>

² <http://www.flowinjectiontutorial.com/Methods%202.2.13.%20Assay%20Protocols,%20Fast%20and%20High%20Sensitivity%20SI.html>

provided for the Collimated Cell intermediate sections mentioned above. This thermostatic heater allows the user to set the temperature of the flow cell. The heater includes a PID controller which can be controlled from a USB port or using manual controls.

Chem-on-Valve flow cells

The Lab-on-Valve concept has been expanded by Global FIA to allow various bolt-on flow cells and accessories including an SPE column and additional confluence point for pseudo FIA mode of operation. Several of the flow cells mentioned in this brochure are available in the COV format.



Chem-on-Valve with bolt on flow cells

Fluorescence flow cell (FL1)

The fluorescence flow cell is a simple cross construction where the excitation inlet and fluorescence outlet are orthogonal. The cell is constructed from black PEEK to shut out ambient light. The flow cell comes equipped with a set of quartz fiber optic cables that are terminated with industry standard SMA connectors for coupling to spectrometer and light source. No windows, lenses or delicate optical components are needed. Where required external optical filter holders can be coupled into the fiber optic path between source and flow cell or flow cell and detector. Fluid connection of the $\frac{1}{16}$ " OD tubing is by means of $\frac{1}{4}$ " fittings.

Photon counter for fluorescence (FC-PC-HLDR)

A holder for the Sen-Tech photon counter allows the use of this sensitive detector for low level fluorescence. A recess in the holder will accommodate standard optical filters for excluding excitation light. Coupling to optical fibers is by means of industry standard SMA connectors.

Chemiluminescence flow cell (GloCel)

The GloCel is equipped with an insert that has a fluid path milled into its surface. This fluid bearing element is covered with a sapphire window and the photon counter butts up to the window for optimum light capture. Two models are available, one with a single inlet and one with a dual inlet for mixing reactants in the eye of the detector.

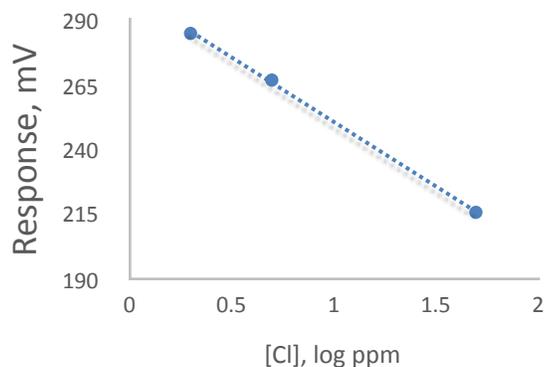


Chemiluminescence in dual inlet insert

Ion selective electrode flow cell (ISE-FC)

Ion selective electrodes including pH electrodes and ORP electrodes have been widely used for discrete wet chemical measurements. This low volume flow cell allows these electrodes to be employed in flow-based analyzers. The flow path is easily flushed between measurements. The cell is designed to accept 12 mm electrodes with a flat electrode surface and integrated annular reference electrode and yields precise and linear calibration curves.

$$r^2=0.9994 \quad y=300.5-49.2x$$



[Cl], ppm	log ppm	Response, mV	%rsd
2	0.301	285	0.395
5	0.699	267	0.069
50	1.699	216	0.061

Detectors

The following detectors have been used with these flow cells and are available from Global FIA:

Measurement	Detector
Photometric	Ocean Optics USB-4000
Photometric	Ocean Optics STS
Photometric	Ocean Optics Flame
Fluorescence	Ocean Optics Flame
Fluorescence	Sense-Tech P25232
Chemiluminescence	Sense-Tech P25232
ISE, ORP, pH	Phidget

Technical Point of Contact

For information on any of these products contact:

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Pricing

P/N	Description	Price
BTFC-5	Bubble tolerant flow cell 5cm	690.00
LS-LED	LED light source	285.00
LS-W	Tungsten-xenon light source	395.00
CC-KIT	Collimated cell kit, 1,5,10,15cm path length	725.00
COV-LPFC	COV long lath flow cell	485.00
COV-SPFC	COV short path flow cell	340.00
COV-FL1	COV fluorescence flow cell	425.00
COV-FC-HTR	COV flow cell heater	Call
COV-CI	COV column insert	250.00
COV-CP	COV confluence point	325.00
CC-HTR	Heater for Garth cell	650.00
GloCel-1	GloCel with single inlet	880.00
GloCel-2	GloCel with dual inlet	880.00
GC-INS-1	GloCel insert with single inlet	250.00
GC-INS-2	GloCel insert with dual inlet	250.00
GC-INS-1-SP	GloCel insert with single inlet, spiral channel	250.00
GC-INS-2-SP	GloCel insert with dual inlet, spiral channel	250.00
CG-INS-CUST	GloCel insert with custom flow channel	Call
FL-PC-HLDR	Photon counter holder for fluorescence measurement	520.00
ISE-FC	Ion selective electrode or ORP flow cell	490.00
	Detectors	Call