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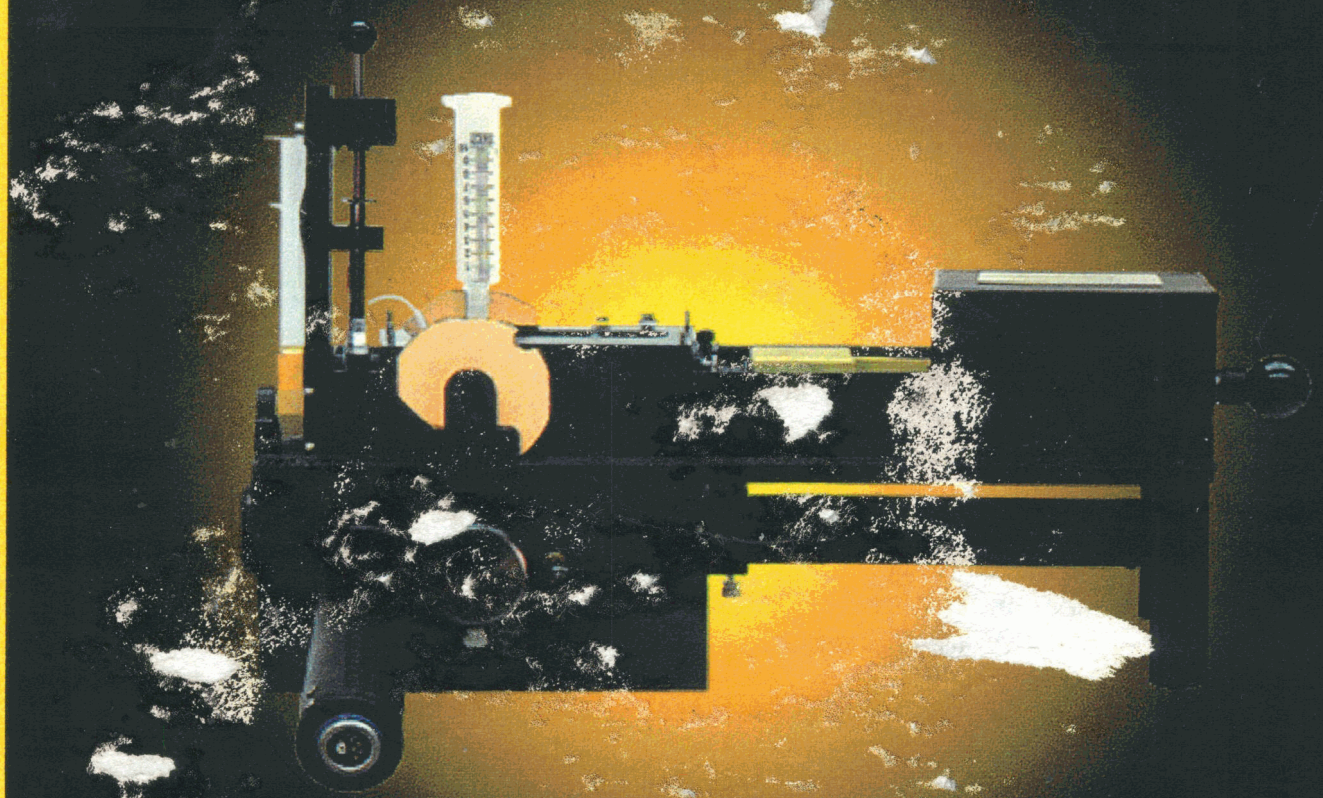
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The *OLIS* USA Stopped-Flow



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THE *OLIS* USA STOPPED-FLOW CELL ASSEMBLIES

Classic Ambient-Temperature Stopped-Flow
Absorbance-optimized, supports fluorescence

Low-Temperature Absorbance Stopped-Flow
Absorbance only

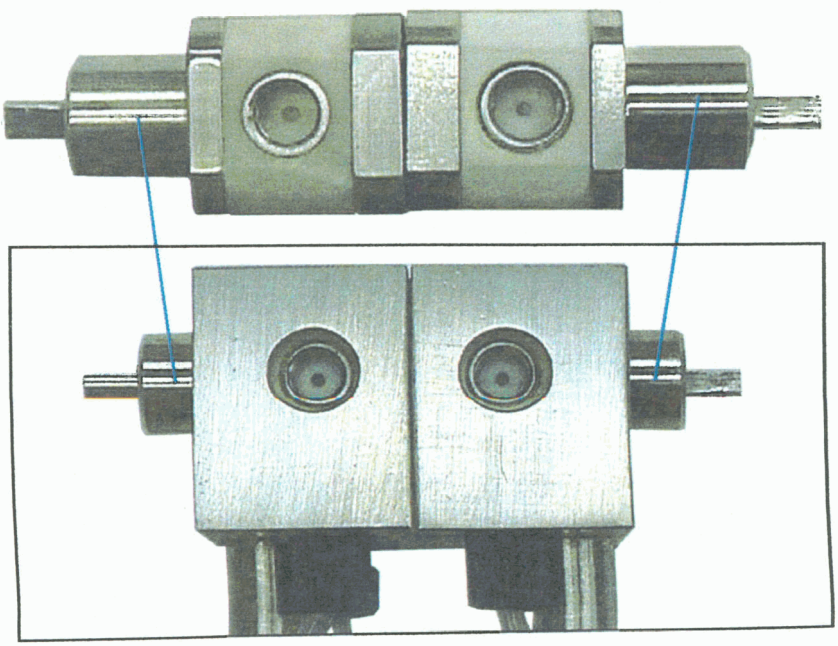
Low-Temperature Fluorescence-Optimized Stopped-Flow
Fluorescence-optimized, supports absorbance

(*A **circular dichroism** stopped-flow cell assembly is in development. Details available upon request.*)

	Classic Ambient-Temperature SF	**Low-Temperature Absorbance SF**	**Low-Temperature Fluorescence SF**
Primary application(s)	Absorbance & fluorescence ambient temperature	Absorbance low temperature	Fluorescence low temperature
Supported application(s)			Absorbance low temperature
Temperature range	10-80°C	-30–80° C	-30–80° C
Optical pathlength	20 mm for absorbance 10 mm for fluorescence	10 mm	4 mm for absorbance & fluorescence
Valve material	ceramic*	ceramic*	ceramic*
Flow tube material	optical-grade quartz	stainless steel	Suprasil (UV-enhanced fused silica)
Drive syringe orientation	horizontal	horizontal	horizontal
Reagent ratios supported	1:1–1:11 as determined by syringe sizes	1:1–1:11 as determined by syringe sizes	1:1–1:11 as determined by syringe sizes
Mixer	Ball-Berger	Ball-Berger	Ball-Berger
Drive mechanism	pneumatic	pneumatic	pneumatic

OLIS Exclusively Offers Ceramic* Valves

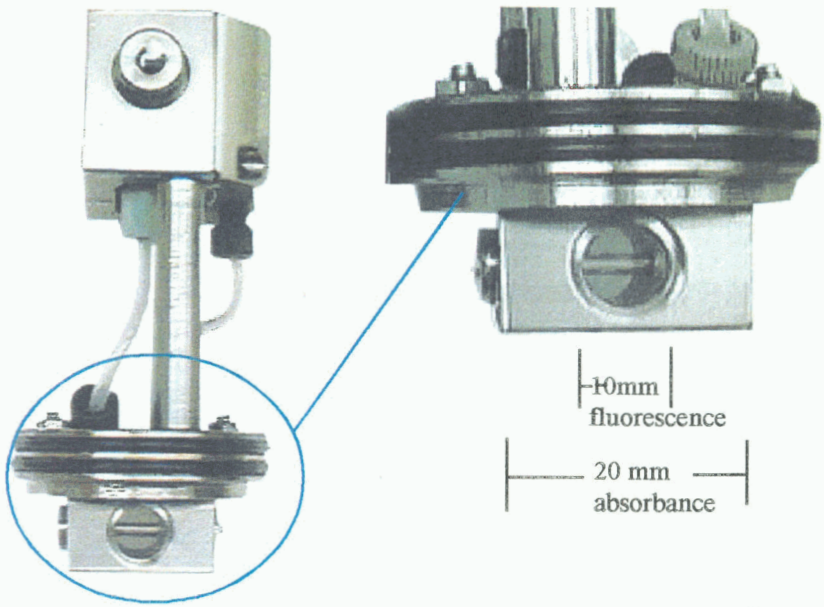
One-piece ceramic valves are used in all *OLIS* stopped-flows. Ceramic valves are leakproof, inert, anaerobic, and impervious to temperature. The photos at right show two valves as they are positioned inside the cell assemblies.



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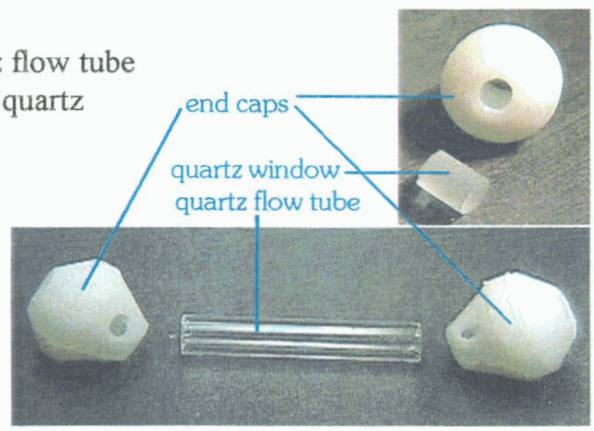
The classic ambient-temperature stopped-flow cell assembly

The classic stopped-flow cell assembly supports both absorbance and fluorescence measurements at moderate temperatures; because Teflon is used in the cell, temperatures below approximately 10°C are impractical. The classic cell assembly is pictured at near right; at far right is a close-up of the flow cell with the fluorescence and absorbance pathlengths indicated.

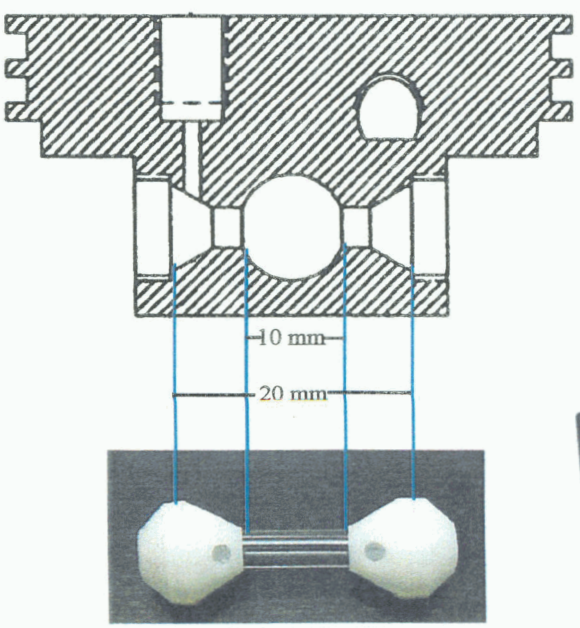


The classic stop-flow cell assembly has a 20-mm quartz flow tube which is mounted between a pair of Teflon end caps. A quartz window is installed in the end of each end cap.

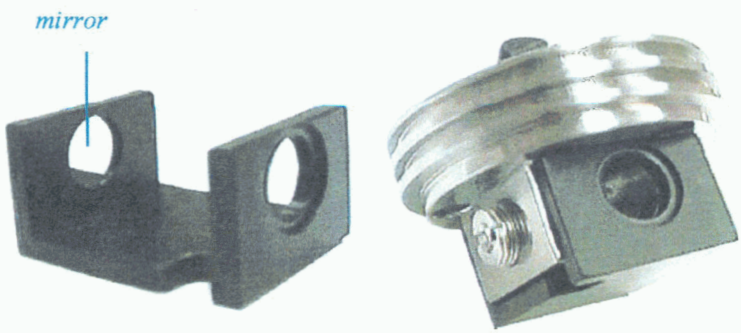
The photos at right show three end caps containing quartz windows, an uninstalled quartz window, and a quartz flow tube. Mixed reagents enter and exit the flow tube through the small holes in the end caps.



The optical pathlengths for the two measurements are indicated in the photos and diagram below.



For fluorescence measurements, a mirror attachment (shown below left) is available to maximize emission collection. The mirror attachment slides over the cell assembly (as shown below right) such that the mirror is positioned directly behind the rear window; emissions that would be lost through the rear window are thereby reflected towards the PMT.

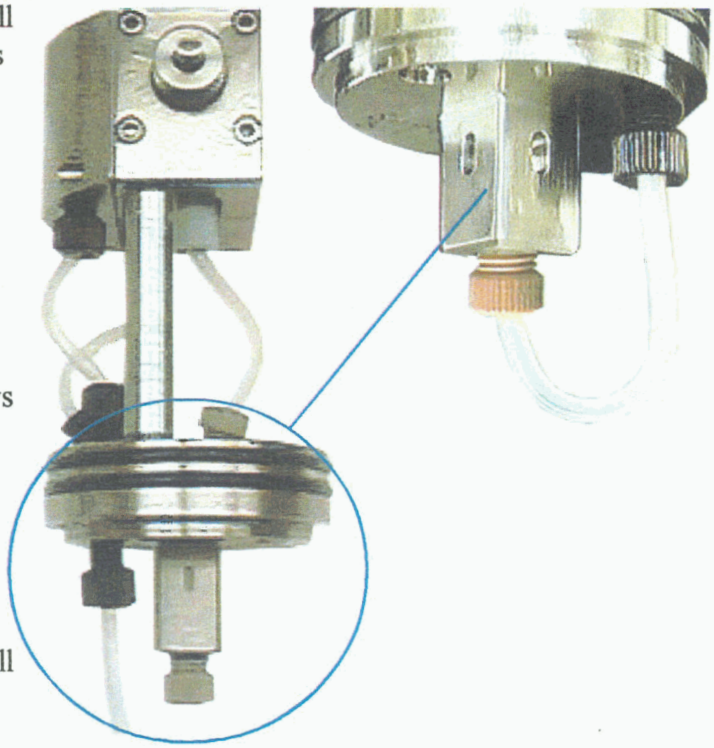


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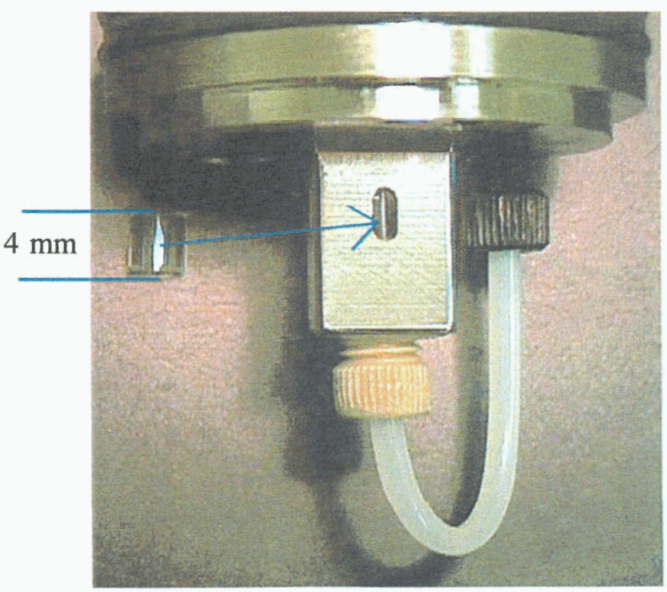
The low-temperature fluorescence-optimized stopped-flow cell assembly

The fluorescence-optimized stopped-flow cell assembly supports absorbance measurements with a short pathlength. Like the classic absorbance/fluorescence cell assembly, the fluorescence-optimized cell assembly has an upper temperature limit of 80° C. The lower temperature limit is approximately -30° C.

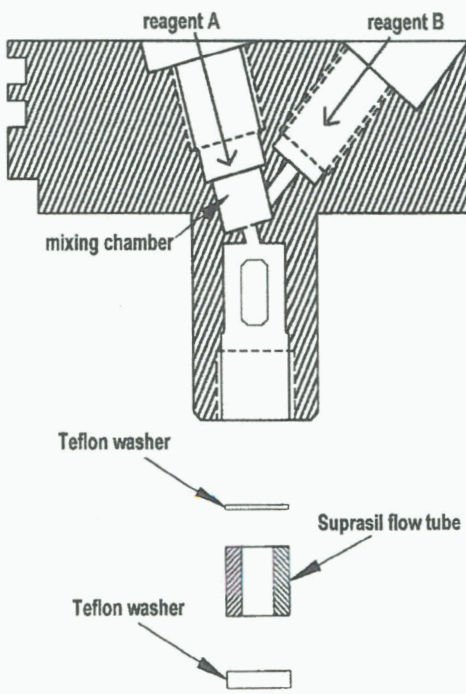
The fluorescence-optimized cell assembly is pictured at near right; a close-up of the flow cell is shown at far right. The close-up shows two sides of the cell assembly; all four sides have windows.



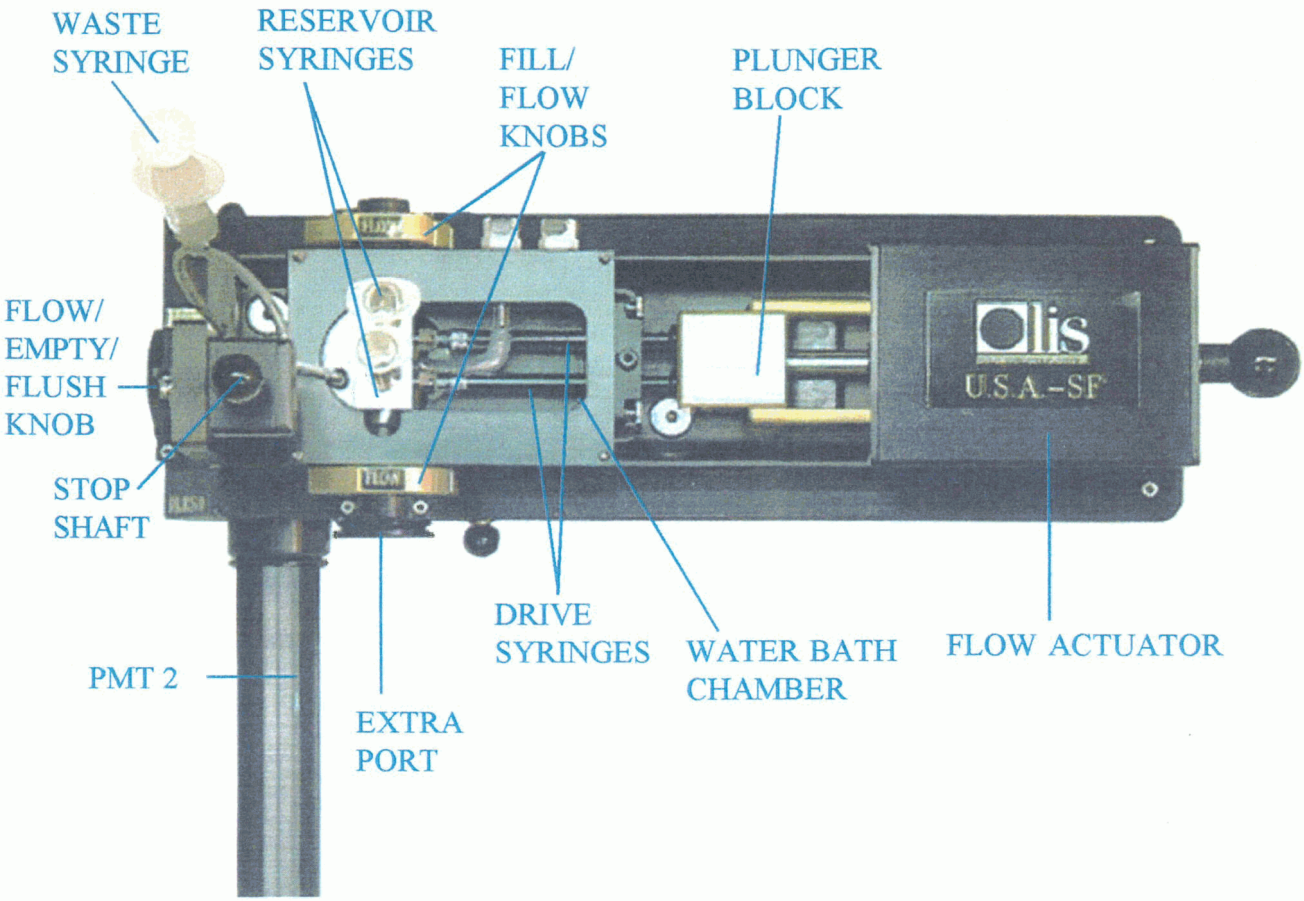
The fluorescence-optimized stopped-flow cell assembly uses a 4-mm flow cell made of Suprasil (UV-optimized fused silica). The photo below shows the Suprasil flow cell next to the fluorescence-optimized cell assembly; an arrow indicates the location of the flow cell within the cell assembly.



The diagram below is a cross-section of the cell assembly.



AERIAL VIEW



SAMPLE CHAMBER: The compartment of the host spectrometer which houses the sample cell. The *OLIS* RSM 1000 sample chamber is shown in the illustrations on this and the previous page. The front view (previous page) shows three ports which can house PMTs and/or provide entry for actinic light.

PMTs: The photomultiplier tubes used as signal detectors, providing single- and dual-beam detection. PMT placement shown on these two pages is for absorbance measurements; PMT 1 is the sample signal detector and PMT 2 is set at 90° to the sample for reference signal detection. For fluorescence measurements, the sample PMT goes in the position labeled 'extra port' and PMT2 can be placed between the light source and sample chamber to allow monitoring of the excitation light.

PLUNGER BLOCK: The block between the flow actuator and the drive syringes which pushes the drive syringe plungers, thus initiating the mixing process.

PURGE SYRINGE: The syringe into which spent reagents are drained.

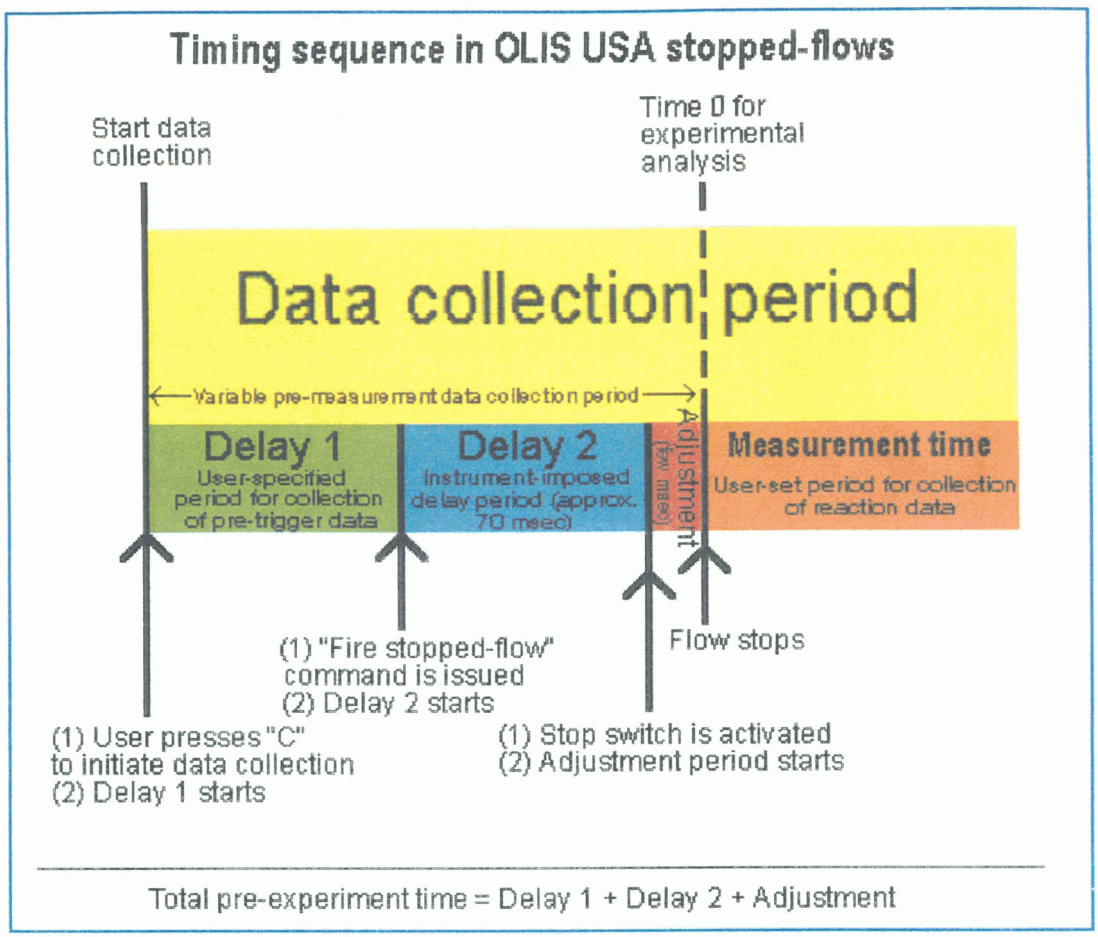
RESERVOIR SYRINGES: The two syringes which hold the unmixed reagents before they are introduced into the drive syringes. These syringes can be plastic (as shown), tonometers, or specialized fluid holders.

STOP SHAFT: The shaft connected to the plunger in the stop syringe which serves as the stopping mechanism at the end of the flow path. The mixed reagents are pushed into the stop syringe, forcing the shaft upwards and activating the sensor on the stop shaft which signals the stop of flow. The system cannot be fired again until the stop syringe is emptied.

STOP SYRINGE: The syringe into which mixed reagents are pushed after they have gone through the sample chamber.

WATER BATH CHAMBER: The floodable well surrounding the drive syringes and their valves which is used for regulating the temperature of the reagents.

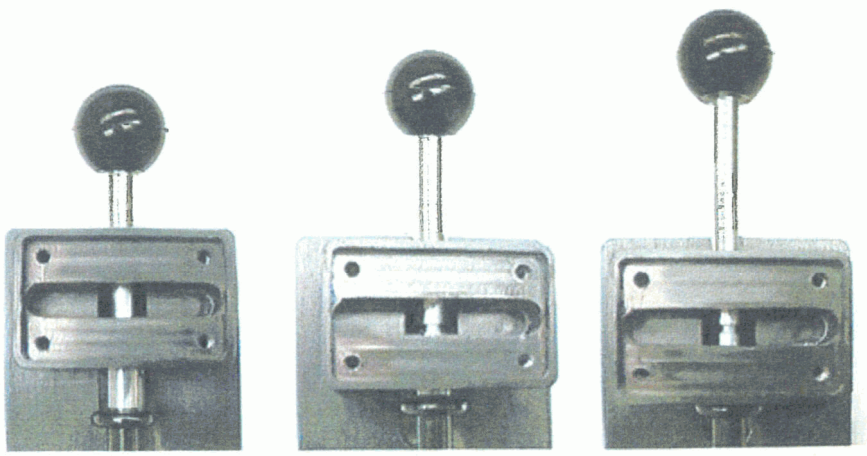
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As the mixed reagents are pushed into the stop syringe, forcing the stop shaft upwards, the shaft passes through the sensor field. When the machined groove in the shaft enters the sensor field, the stop sensor is activated and the software is alerted to the impending stop of flow. Approximately 2–5 milliseconds later, the plunger in the stop syringe strikes the underside of the sensor housing and the flow stops.

The photos below show the stop shaft in the process of passing through the stop sensor field. In the photo on the left, the machined groove has not yet reached the sensor field. In the middle photo, the machined groove has just entered the sensor field, activating the stop sensor. In the photo on the right, the flow has stopped and the top of the stop syringe plunger rests against the underside of the sensor housing.

The adjustment period of the stopped-flow timing sequence is the time it takes for the stop shaft to rise from the position shown in the middle photo (stop sensor activation) to the position shown in the right photo (stop of flow); the range is typically a few milliseconds.



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