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*Azura*

**Flow Cell Cartridge**

Supplement

V6708A



HPLC



Please read the corresponding technical documentation for handling and safety reasons.

### **Manuel en français:**

Si jamais vous préféreriez un manuel en français pour ce produit, veuillez contacter le support technique (Technical Support) par email ou par fax avec le no. de série. Merci beaucoup.

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## Product information

This supplement provides useful information for the KNAUER LightGuide flow cell cartridges and KNAUER PressureProof flow cell cartridges. These flow cells are compatible with the following KNAUER detectors: DAD 6.1L, DAD 2.1L, MWD 2.1L. As all wetted parts are bio-compatible the flow cells are suitable for LC and Bio and FPLC applications (except article no. AMC19XA and AMD59XA).

### **KNAUER LightGuide flow cell cartridges**

The KNAUER LightGuide flow cell cartridges combine maximum light throughput (due to total internal reflection) with minimal peak dispersion (due to the small cell volume) to guarantee an optimized signal to noise (S/N) ratio.

The LightGuide technology stands for:

- total reflection technology for excellent light transmission
- low cell volume enabling detection of fast eluting peaks

The High Sensitivity KNAUER LightGuide flow cell is ideal for trace analysis. The Standard KNAUER LightGuide flow cell is ideal for high throughput and high resolution.

### **KNAUER PressureProof flow cell cartridges**

The KNAUER PressureProof flow cell cartridges are optimized for conventional and high flow HPLC and FPLC applications. These flow cells feature:

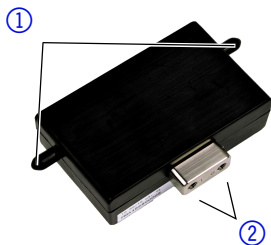
- an increased pressure stability (up to 300 bar)
- extended flow rate range (up to 20 and 100 ml/min)

## Installation

With the delivery you receive an accessories kit that includes a waste tubing kit, capillary (LightGuide only) and fittings. Use the waste tubing kit to connect the flow cell to the waste container and the other components to connect the flow cell to the system. Before connecting to the flow cell, flush your column with mobile phase to keep the flow cell clean.

## Process

1. Unpack the flow cell cartridge.
2. Remove the hoods from the light inlet and outlet ① (see Fig. 1).
3. Remove the hole plugs from the inlet and outlet cartridge ②.
4. Insert the flow cell into the detector. For further details, consult the detector's user manual.
5. Connect the capillaries. For further details, consult the waste tubing kit's supplement.



Keep the hoods and hole plugs for later use, e. g. storage. The hoods and hole plugs protect the flow cell against contamination and solarization.



The accessory kit for the LightGuide flow cell cartridges includes capillaries optimized for fast analytical (U)HPLC (0.13 mm ID). When working with higher flow rates, this capillary should be exchanged for one with a larger inner diameter.

## Troubleshooting

Problem	Solution
Contamination	Clean the light inlet or outlet with a lens cloth moistened with alcohol or a cotton swab
Leak caused by overpressure	Reduce the flow/pressure If the leak continues, the flow cell must be replaced (no repair possible)
Increased baseline noise/ reduced sensitivity	Clean the flow cell

Consult the detector's user manual for additional information on troubleshooting.

## Cleaning

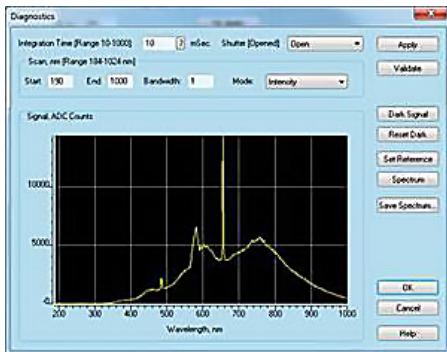
Do not let buffers stay for a long time in the flow cell. We highly recommend flushing the flow cell cartridge after running an application with buffers. The following solvents are recommended for cleaning:

- water (when using buffers)
- ethanol or methanol
- isopropanol

Never touch the light inlet and outlet as this could lead to contamination which reduces the performance of the flow cell (intensity, wavelength accuracy). Should this occur however, clean with a lens cloth moistened with alcohol or a cotton swab.

To diagnose this issue, we recommend generating an intensity spectrum

(via your chromatography software under Diagnostics). Dirty fiber optic ends result in little or no UV light (see Fig. 2).



**Fig. 2 UV spectrum with contaminated fiber**

## Advanced flow cell cleaning

This section describes a cleaning procedure for aggressive cleaning of LightGuide flow cells.

### Preparation of chemicals

- All chemical reagents should be of at least ACS-Grade, preferably HPLC-Grade. This procedure involves the use of caustic and flammable reagents. Consult the manufacturer's MSDS for necessary safety precautions.

## Prerequisite

The following 3 cleaning solutions:

Cleaning solution 1. 0.5M Potassium Hydroxide in 100% Ethanol (briefly, 7.013g KOH in 250mL EtOH). After thorough mixing, the solution should be filtered through a 20 $\mu$ m pore size filter.

Cleaning solution 2. 100% Methanol

Cleaning solution 3. Ultrapure water, Type I per ASTM D1193-99 or equivalent.



Grade 1 ultrapure water per ISO 3696 differs significantly from the above classification.

## Cleaning procedure

The preferred method of cleaning involves the use of a spectrophotometer in "monitor mode" throughout the entire cleaning process. This allows the technician to observe the extent of performance improvement as a function of time.

The simplest cleaning method involves using a peristaltic pump to flow each cleaning solution through the sample cell in numerical order. It is recommended the pump is configured to "pull" through the cell to avoid possible contamination from degraded peristaltic pump tubing. Each solution is cycled for approximately 3-4 minutes, with a bolus of air introduced between each solution. This procedure is repeated until there is no noticeable improvement in sample cell performance. The flow direction can be reversed between cycles to ensure thorough cleaning.

To lessen the time required for the above cleaning method, large bubbles of air can be introduced into the sample cell alternately with the cleaning solutions. This method uses a laminar flow profile and radial diffusion to effectively "scrub" the inside of the sample cell.



It is imperative that Solution #2 immediately follows Solution #1 to remove residue remaining on the optical components. Failure to do so will result in poor flow cell performance.

Another possible cleaning method involves the use of two syringes of appropriate volume connected to the liquid ports of the sample cell.

In numerical order, each cleaning solution is introduced into the sample cell and flushed back and forth between the syringes 10-12 times. This procedure is repeated until there is no noticeable improvement in sample cell performance.

### Final rinsing procedure

Once the technician identifies the point where subsequent cleaning cycles no longer improve the performance of the flow cell, the unit should be flushed with ultrapure water for a period of at least 15 minutes to ensure all cleaning solutions have been completely removed and there are no persistent residues that might affect flow cell performance or stability.

## Storage



Never store the flow cell in pure water to prevent microbial contamination.

1. Flush the flow cell cartridge.
2. Disconnect the capillaries.
3. Close the inlet and outlet with the hole plugs.
4. Release the flow cell from the detector.
5. To secure the light inlets and outlets, replace the hoods.

## Technical data

### Standard LightGuide flow cell cartridge

Path length	10 mm
Capillary connection	1/16"
Flow cell volume	2 $\mu$ l illuminated volume (0.8 $\mu$ l dispersion volume)
Maximum flow rate	5 ml/min
Maximum pressure	50 bar
Wetted materials	Quartz (SUPRASIL)/Teflon®/stainless steel/PEEK



## High Sensitivity LightGuide flow cell cartridge

Path length	50 mm
Capillary connection	1/16"
Flow cell volume	6 $\mu$ l illuminated volume (2 $\mu$ l dispersion volume)
Maximum flow rate	5 ml/min
Maximum pressure	50 bar
Wetted materials	PEEK/quartz (SUPRASIL)/Teflon®/stainless steel

## Analytical PressureProof flow cell cartridge

Path length	10 mm
Capillary connection	1/16"
Flow cell volume	10 $\mu$ l
Maximum flow rate	20 ml/min
Maximum pressure	300 bar
Wetted materials	Titanium/quartz (SUPRASIL)/PEEK

## Semi-Preparative PressureProof flow cell cartridge

Path length	3 mm
Capillary connection	1/16"
Flow cell volume	2 $\mu$ l
Maximum flow rate	100 ml/min
Maximum pressure	300 bar
Wetted materials	Titanium/quartz (SUPRASIL)/PEEK

## Repeat orders

<b>Name</b>	<b>Order no.</b>
Standard LightGuide flow cell cartridge, 10 mm	AMC19XA
High Sensitivity LightGuide flow cell cartridge, 50 mm	AMD59XA
Analytical PressureProof flow cell cartridge, 10 mm	AMC38
Semi-Preparative PressureProof flow cell cartridge, 3 mm	AMB18
Accessory kit LightGuide	FMC19XA
Accessory kit PressureProof	FMC38
Waste tubing kit LightGuide	A9842
Waste tubing kit PressureProof	A9843

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