

# User Manual

## FOR COMPACT FLOW-THROUGH CUVETTES WITH SCREW CONNECTIONS

Thank you for choosing a quality product from Hellma Analytics. Hellma's premium cuvettes for use in laboratories are manufactured and tested with the greatest care and strictly adhere to DIN ISO EN 9001 and 14001, ensuring high quality and a long lifespan. **Please take a moment to familiarize yourself with the following information.**



## 1. PRODUCT DESCRIPTION

Depending on the type, the compact flow-through cuvette is made of special optical glass (OS) or quartz glass (QS) framed with an anodized aluminum holder with M6 threaded holes. It offers numerous advantages and characteristics suited to day-to-day use.

- M6 threaded holes ensure secure tube connections
- Compression-resistant up to 3 bar
- Precise optical path lengths (+/- 0.01 mm)
- Glass materials used are highly chemical-resistant
- Temperature stability up to max. 50°C
- Set of tubes provided are made of solvent-resistant FEP

## 2. SAFETY INFORMATION

The compact flow-through cuvette is made of special optical glass (OS) or quartz glass (QS) framed with an anodized aluminum holder. Like all glass components, it must be handled with care to prevent damage caused by tipping over, dropping, bumping or scratching.

**To enjoy your compact flow-through cuvette for as long as possible, please observe the following information:**

- DO NOT **leave** the cuvette on the table unprotected.
- Clean the cuvette immediately after use (see 4.)



**Do not allow the sample to dry in the cuvette.**

- After use, store the cuvette safely in the box supplied.



**Do not expose the cuvette to temperatures below 4°C or over 50°C!**



**When using the cuvette, take care to avoid contaminating or scratching the delicate measurement windows through contact with your hands or objects, as this can affect the accuracy of measurement results.**

## 3. USING THE COMPACT FLOW-THROUGH CUVETTE

**Connecting the tubes using M6 threaded connectors**

- 1. Make sure you follow the instructions in the correct sequence when connecting the tubes provided.**
  - Begin with the tube with the short screw connection,
  - followed by the tube with the long screw connection.
- 2. Tighten the connections.**
  - DO NOT **use** any tools (e.g. pliers)
  - Simply tighten the screw connections by hand as much as possible.

Each cuvette undergoes a final inspection, where Hellma uses a pressure of 3 bar to test the tightness of such screw connections.

- 3. Make sure that the inlet tube is screwed to the thread marked with the arrow (white arrow on the front of the cuvette).**



## 4. CLEANING

Improper cleaning of the compact flow-through cuvette can impair its function and cause damage.

### IMPORTANT

- Clean the cuvette as soon as possible after taking measurements.



**DO NOT let the sample dry in the cuvette!**

- Please note when cleaning – the **aluminum holder is not acid-resistant**, so the compact flow-through cuvette must always be cleaned using a continuous flow of liquid.
- Use soft, lint-free cloths or swabs to clean the exterior.
- DO NOT **clean** the cuvette using an ultrasonic cleaner.



**This can cause microcracks, which lead to the destruction of the cuvette!**

### Cleaning the cuvette after measuring:

1. **After taking the measurement, immediately rinse the cuvette with the same solvent used for the sample.**
2. **Next, thoroughly rinse the cuvette using pure ethanol or a similarly volatile solvent and leave to dry (e.g. in a drying cabinet). Ultrapure water can also be used to rinse the cuvette, but this will slow down the drying process.**

### Routine cleaning:

The compact flow-through cuvette should only be cleaned using a continuous flow of liquid. This flow is achieved by using a pump to connect the inlet of the cuvette to a storage tank filled with cleaning concentrate. Connect the drainage tube to the storage tank as well. We recommend using Hellmanex® III cleaning concentrate for this closed circuit. 2% aqueous Hellmanex III solution has been proven to be effective for the most common cleaning tasks. Please observe the information on the bottle. Afterwards, thoroughly rinse the cuvette using ultrapure water.

### Removing stubborn contaminants

- Protein-based contaminants can be removed using diluted hydrochloric acid.
- Concentrated sulfuric acid can be used to remove many organic substances.
- If neither hydrochloric acid nor sulfuric acid work, try removing the impurity using mixtures such as  $H_2SO_4/H_2O_2$ . This type of cleaning, however, should only be carried out by experienced employees.



**Please follow the protective measures recommended by the manufacturers when using this aggressive mixtures.**

### Removing external contaminants

External contaminants are best wiped away using a damp cloth or a lint-free microfiber cloth. Dampen the cloth with a solvent (e.g. alcohol).

## 5. TROUBLESHOOTING

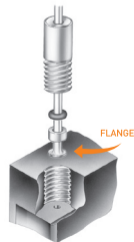
1. **Liquid is escaping from the slit between the aluminum frame and the glass body of the cuvette. Possible issues and steps to take:**

**A The screw connections have not been tightened enough or have become loose.**

- Check the screw connections and tighten them again.

**B There are dirt particles between the upper surface of the cuvette and the flange.**

- Open the screw connections and check the flange and the upper surface of the cuvette around the holes. If these are dirty, carefully clean the upper surface of the cuvette and the flange.
- DO NOT use any **hard** or sharp tools when cleaning.





**C The flange on the tubes is broken or damaged.**

- Open the screw connections and check the flange at the end of the tube. If you find a defect (e.g. a crack or a chip), replace the screw connection with a new one.

**D The holes on the upper surface of the glass body of the cuvette are damaged and chipped, preventing the flange from sealing.**

- Open the screw connections and check the holes in the cuvette. If you discover any chips around a hole, please contact Hellma customer service.

**E Parts of the screw connections provided have been replaced with parts that are not the correct size, e.g. screws with threads that are too short.**

- ONLY use **original** Hellma screw connections.

**If after following these steps you are still experiencing problems with the screw connection seal, please contact Hellma customer service.**



**2. Measurement values fluctuate significantly.**

- Loosened screw connections can cause leakage and bubbling.
- Ensure that all screw connections are screwed tightly (by hand – **DO NOT** use tools).

**3. Bubbling in the cuvette**

- Loosened screw connections can cause leakage and bubbling.
- Insufficient cleaning can lead to bubbling in the cuvette.
- Clean the cuvette according to the recommendations in this manual to prevent bubbling.
- If bubbling persists despite a tight screw connection and an optimally cleaned cuvette, the bubbles were presumably present in the sample/solution to be analyzed. In this case, it is important to produce a bubble-free sample/solution.



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