

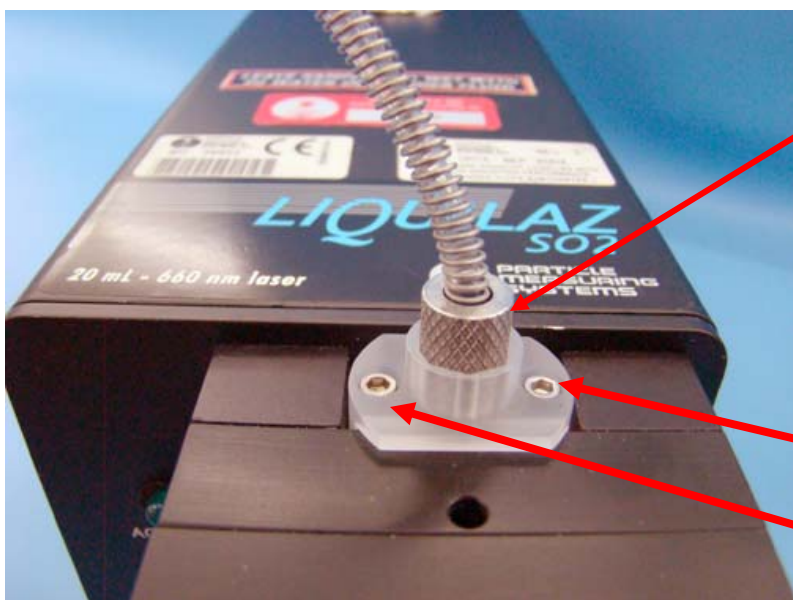
LiQuilaz[®] Particle Counter Maintenance Capillary Cleaning Procedure

Introduction

This is a basic guide to LiQuilaz[®] particle counter maintenance. Occasional cleaning is required of the liquid capillary and it is the customer's responsibility to perform the cleaning when necessary. The need for capillary cleaning and the general health of the capillary can be improved by continuously running water through the system when not in use. In addition, the capillary should never be allowed to dry out as this could permanently damage the capillary.

Procedure Using Syringes

1) Isolate the LiQuilaz particle counter from fluid source.



Remove and connect this fitting only. See steps 2 and 5.

CAUTION
DO NOT REMOVE THESE SCREWS!



CAUTION
DO NOT ALLOW LIQUID TO
ENTER THESE AREAS

- 2) Disconnect fluid inlet and outlet fittings from the LiQuilaz particle counter.
- 3) Select appropriate cleaning solution (see Note 1).
- 4) Fill each cleaning syringe with 5 mL of cleaning solution.



- 5) Attach one cleaning syringe to LiQuilaz inlet, and the other to LiQuilaz outlet.

6) Force the cleaning fluid back and forth between the two syringes for 30 seconds to one minute.

7) Remove syringes, being careful not to spill fluid into gaps between metal sections of LiQuilaz housing. Immediately wipe up any spills.

8) Connect LiQuilaz inlet to source of ultra-pure deionized water. Connect LiQuilaz particle counter outlet to drain suitable for cleaning fluid. Flush cleaning fluid from LiQuilaz for 3 - 5 minutes with DI water.

9) Check DC light using software provided. If DC light fails to meet sensor specifications (Table 1), repeat cleaning with syringes until successful. If a series of cleaning attempts has been unsuccessful with the syringe, follow the Cleaning Procedure using Floss section of this document or return to Particle Measuring Systems' certified service

CLS-700 Particle Counter Warning

When the LiQuilaz particle counter is removed from a CLS 700T particle counter system make sure the sample inlet and outlet tubes, which were removed to facilitate cleaning, have been connected together, or directed into an appropriate drain during this test. Failure to do so could result in severe personal injury, as water from the sampler will be forced out of the open tubing under pressure.

Table 1: DC Light Specifications

LiQuilaz S02	<0.5 volts
LiQuilaz S03/S05	<0.03 volts
LiQuilaz E20P	>7 volts

Note 1: Cleaning Solution

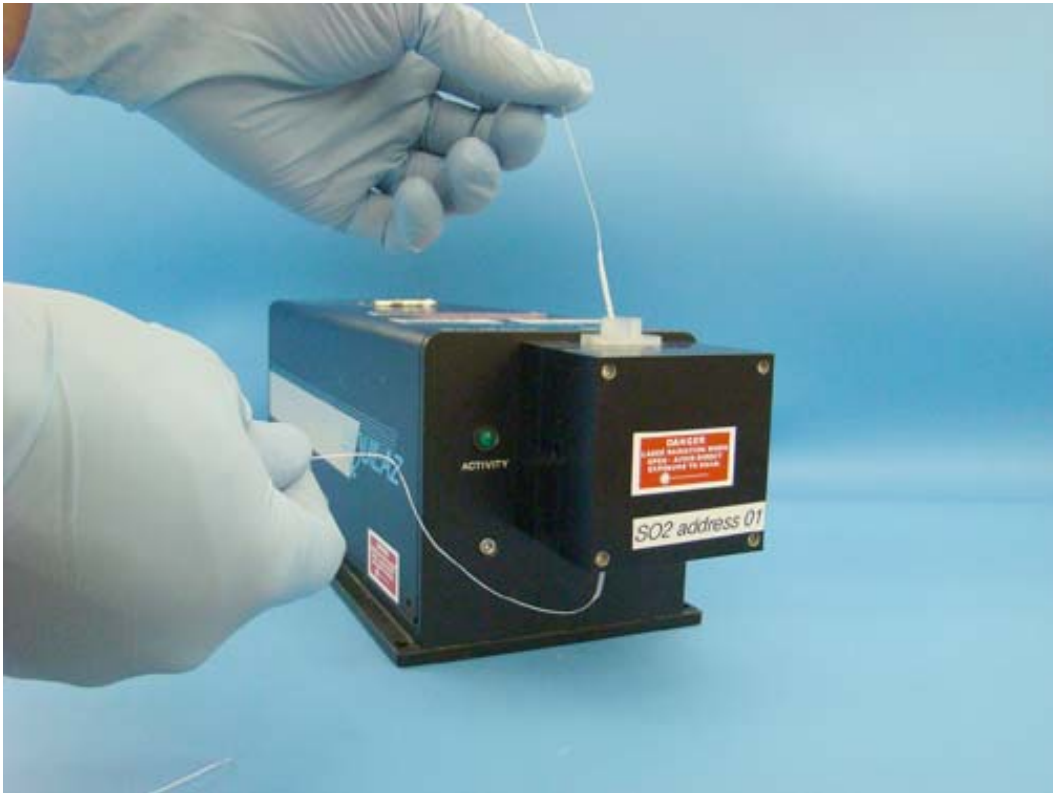
When selecting an appropriate cleaning solution, consider the types of contamination that will have deposited onto the capillary from the most recent fluid sampled. For instance, if DI water was sampled last, bacteria, or particles are the most likely sources of contamination. If solvents were sampled last, optical hazing due to chemical impurities is most likely. Both of these situations can be easily remedied using high quality laboratory glassware cleaner such as IsoClean® or Micro-90®. A 5% solution of glassware cleaner in ultra-pure DI water should be used.

In cases where polymers were sampled, the most likely cause of contamination is trace polymer dried to the capillary. In this case, long term soaking in the appropriate solvent for the polymer will probably be necessary to facilitate removal of the contaminant. Using the solvent with the cleaning syringes after soaking (assuming compatibility) should dislodge the residual contamination. Follow this with a DI flush, and, if necessary, additional cleaning with glassware cleaner.

Cleaning Procedure using Floss

Sometimes the source of contamination is aggressively attached to the surface of the capillary. When these rare events occur, using cleaning syringes will not be sufficiently effective to return the DC light value to acceptable limits. Under these situations, using a product called SuperFloss®, manufactured by Oral-B®, will sometimes dislodge the contamination. Follow these steps only after an unsuccessful series of attempts to clean the capillary with the syringes.

- 1) If necessary, remove the 6 mm fittings from the LiQuilaz particle counter inlet and outlet fittings.
- 2) Remove a single strand of SuperFloss from the package. Do not use "flavored" floss that can leave a film on the capillary instead of cleaning it
- 3) One end is stiffened with wax, while the other is only compressed into stiff dental floss. Never pass the waxed end through the capillary. Identify the un-waxed end, and insert it through the capillary. As the spongy section reaches the capillary, wet it lightly with the cleaning solution identified in step 3 above. Be very careful not to spill any fluid onto the gaps between the metal sections of the LiQuilaz particle counter housing. Immediately wipe up any spills.



- 4) Gently pull the wetted portion of the spongy floss back and forth through the capillary. The best technique is to pull on one end without holding onto the other end. Then release

the side you were pulling, and begin pulling from the other end. This will allow the floss to remain large and spongy as it travels through the capillary, contacting all surfaces of the capillary.

5) After 10 - 15 seconds of flossing action, remove the SuperFloss from the capillary. Remember, do not pull the waxed end through the capillary. Remove it from the same direction that it was inserted.

6) Connect LiQuilaz particle counter inlet to source of ultra-pure deionized water. Connect LiQuilaz outlet to drain suitable for cleaning fluid. Flush cleaning fluid from LiQuilaz for 3 - 5 minutes with DI water.

7) Check DC light using software provided. If DC light fails to meet sensor specifications (Table 1) repeat cleaning with one additional strand of SuperFloss. If DC light still does not meet sensor specification, return to Particle Measuring Systems' certified service.

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Micro-90® is a registered trademark of the International Products Corporation.
SuperFloss® and Oral-B® are registered trademarks of Procter & Gamble.

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Particle Measuring Systems Headquarters
5475 Airport Blvd., Boulder, CO 80301
1-303-443-7100 1-800-238-1801 Fax: 1-303-546-7331
Instrument Service & Support: 1-800-557-6363
Customer Response Center: 1-877-475-3317

Particle Measuring Systems Europe
Tel: +44 1684 581000
PMSEurope@pmeasuring.com

Particle Measuring Systems Japan
PMSJapan@pmeasuring.com

Particle Measuring Systems Asia Pacific
PMSAsiaPacific@pmeasuring.com

Particle Measuring Systems Singapore
Tel: +65-6496 0330
PMSSingapore@pmeasuring.com

Particle Measuring Systems China
PMSChina@pmeasuring.com

Particle Measuring Systems Mexico
PMSMexico@pmeasuring.com

Particle Measuring Systems Puerto Rico
PMSPuertoRico@pmeasuring.com

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