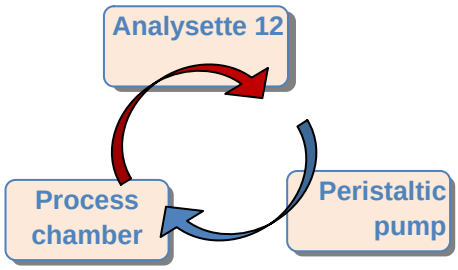
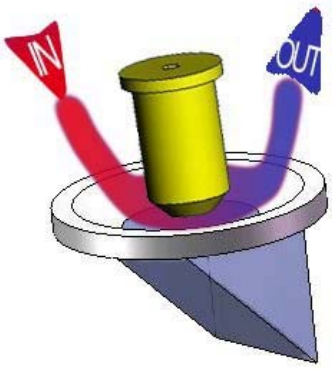
This document gives you the guidelines to prepare the correct setup for In-Line Measurements.

# I. Principle reminder

*The* Analysette 12 *is part of a closed circulating loop drived by a peristaltic pump. Such a setup allows an in-Line measurement providing a real time size analysis of particles during an experimental process.*

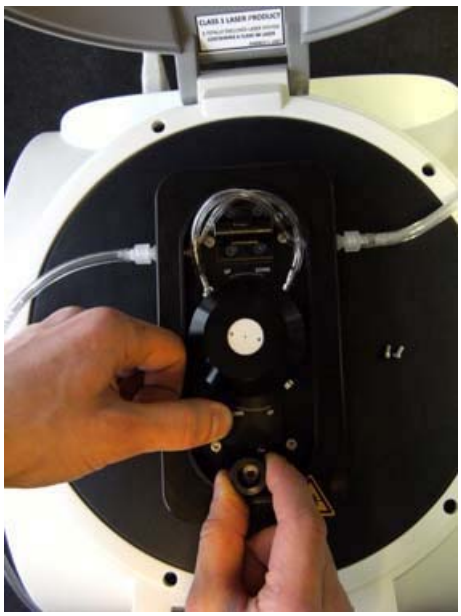



*The flow enters the measurement cell through a first nozzle. When the cell is fulfilled, the flow gets out through a second nozzle. Moving the DTC Up to Down catches a very small sample (few tens of microns thin film layer). The flow keeps going all around the DTC without disturbing the measurement in progress.*

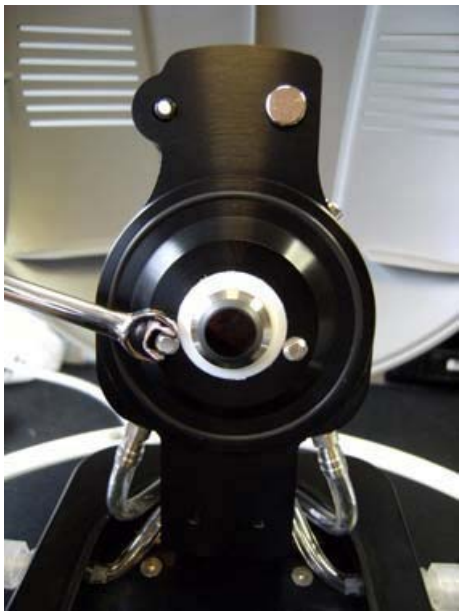
# II. Closing the measurement cell

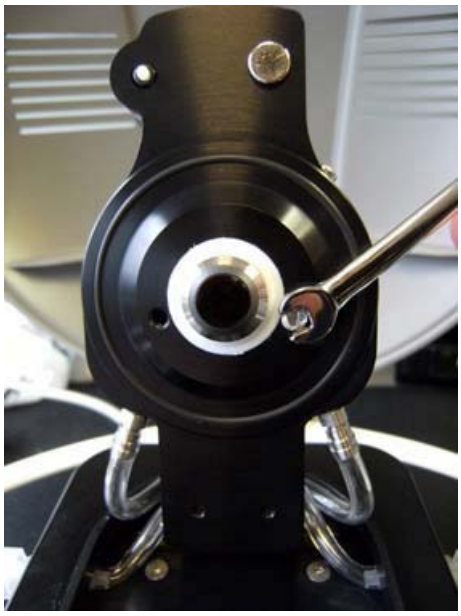
*In accordance with dynamic solvent tightness considerations, the measurement cell must be tightened up in order to compress the external O-ring enough. That's why, In-Line measurement head seems to be hardener to close than a standard one.*



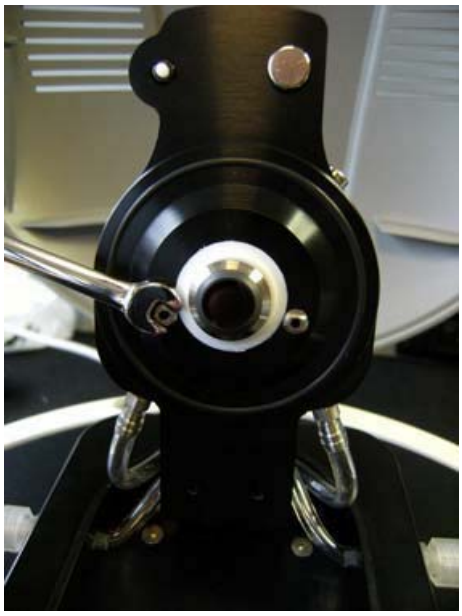
*Hardly press the lever down before turning the closing screw*

## III. Remove Stopper screw





*Unscrew both fluid stopper with supplied wrench*



*Replace with drilled ones for In-Line measurements*

*To ensure a better solvent tightness we advice the user to wrap the threaded part of the stopper with Teflon tape (PTFE) (3 loops). This fitting must be leak free mainly when* Analysette 12 *is used in standard sampling mode to avoid any system clogging by the sample when pressing the flusher or turning the DTC Up and Down.*

## IV. Place the peristaltic pump after Analysette 12

*The preferred setup would be to place the peristaltic pump after* Analysette 12*.*

*Then the suction due to lower pressure within the measurement cell will ensure its complete solvent tightness.*

# V. Maximum ratings and specifications

| | |
|---|---|
| *Typical Peristaltic pump tube* | inner diameter = 3.1mm<br>outer diameter = 6.4 mm |
| *Maximum rate before thin film perturbation* [(1)] | 60 mL/minute |
| *Maximum flow rate for washing solvent* | 400 mL/minute |
| *External O-ring material* | Vyton® |
| *Scraping ring material* | PTFE |
| *Tubes material* | Vyton® |

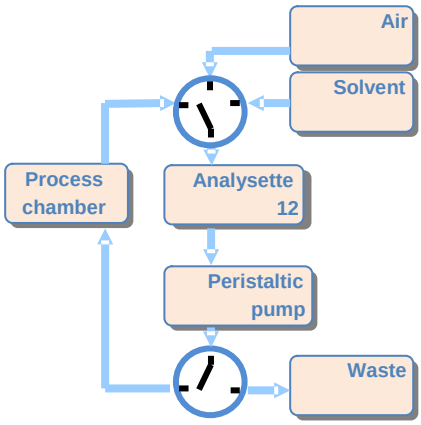
(1) Beyond this flow rate, measurement is disturbed. The Brownian motion unicity in the particles movement is no more ensured, sizes tend to appear lower than they are.

# VI. Clean the system

Take a special care to well cleaning the tubing circuit after each measurement session.
We recommend two steps:

1. Disconnect the input port of Analysette 12 from the loop, in order to let air entering the system. Increase the pump rate (use Prime function) to flush the system.
2. Disconnect the output port of Analysette 12 from the loop and direct it towards a waste container. Plunge the input port in a solvent bottle. Increase the pump rate (use Prime function) to wash the system. Do it in two times. 200 mL are necessary to perform a complete cleaning of the cell and its tubing system.

Provided ¼ Luer fittings are a good solution to have enough flexibility in connect/disconnect the tubing system. A more complex but more hermetic solution is to use manual rotary valves.




# VII. Tip for diluted samples

Even though the In-Line measurement is expressively dedicated to concentrated sampled according to its principle you may meet the experimental case where your initial solution is not enough diffusing (small size, concentration, etc.). A practical tip is to create a short length by-pass with a 2x2 manual valves. That's no more an In-line measurement and you have to be sure the part of the sampling solution contained in the tubes will not modify the process when it will be recombined in the chamber.