Agilent

Agilent NanoDis

Quick Start Guide

This guide covers the following modules: Agilent NanoDis System (G7937AA)

Additional Equipment Required (Not Supplied)

Agilent Technologies does not supply Cross Flow Filters. For further information and recommended suppliers, contact the Dissolution team (**dissolution.hotline@agilent.com**).

CAUTION

Damage of equipment by overpressure

A closed top horizontal filter connection during experimentation can cause potentially damaging pressure build-up in the filter and the system.

✓ **Leave open the top horizontal connection of the filter during experimentation.**

Installation of Peristaltic Pump Tubing and Cassettes

To install the peristaltic pump tubing and cassettes, complete the following steps:

1. Remove the cassettes by pressing the barbed part of the cassette and pushing it upwards.
2. Using the peristaltic pump tubing, attach the tubing adapters and fasten them into the cassettes. Ensure that the tubing clips are embedded correctly, see Figure 1 on page 1.
3. Ensure that the pressure control lever is fully open. Re-insert the cassette into the Peristaltic Pump and secure them by re-attaching the side support bar, see Figure 2 on page 1.
4. Adjust the pressure control lever so that sufficient pressure is applied to the peristaltic pump tubing to allow free flow of the media. A flow rate of 40 corresponds to an approx. flow rate of 6.0 mL/min

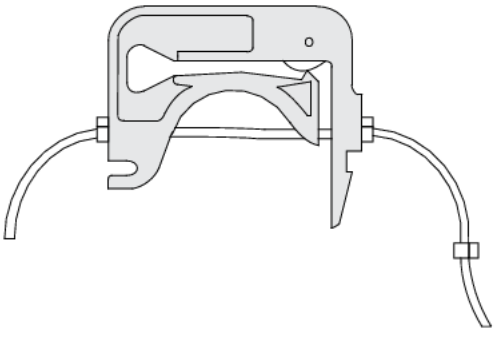

Figure 1 Peristaltic Pump Cassette

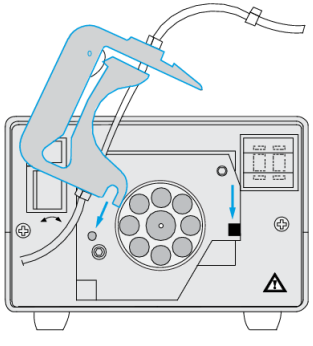

Figure 2 Installing Cassettes

NanoDis System Tubing Guide

The following Figure 3 on page 2 shows the components of the NanoDis System and provides information about the required tubings.

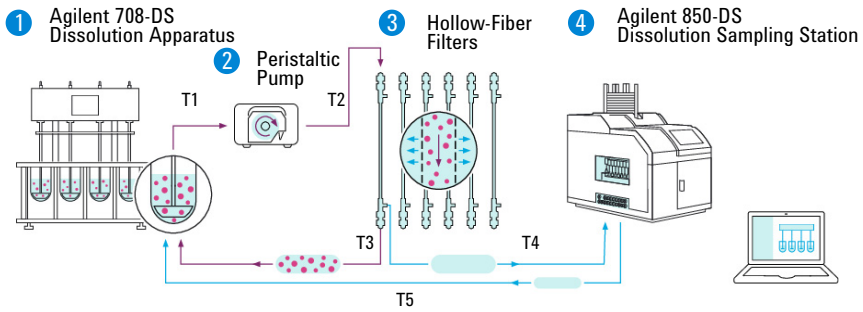

Figure 3 Diagrammatic representation of the NanoDis System

T1	708-DS – 850-DS Sample Cannula (6-Position: 1005–1920, 8-Position: 1005–1921)
T2	M1/4–28 to M1/4–28 Tubing Kit (1005–1729)
T3	Cannula Tubing Kit (5005–0066)
T4	Luer to M1/4–28 Tubing (1005–1953)
T5	708-DS – 850-DS Return Cannula (6-Position: 1005–1920, 8-Position: 1005–1921)

Method Troubleshooting Guide

Controlling Peristaltic Pump Speed

The speed of the Peristaltic Pump is regulated by the manual controls on the front of the pump. It is suggested to run a method with blank media and adjust the pump to achieve the correct speed. Start slowly, and increase the speed to avoid overfilling, overpressure, or leakage.

Table 1 Flow settings

Flow Setting	Approximate Flow Rate
40	6.0 mL/min
60	8.5 mL/min
80	11.5 mL/min

Determination of Maximum Sample Volume

The maximum sample volume ($V_{SampleMax}$) can be calculated as follows:

$$V_{SampleMax} = V_{Filter} - (V_{PrimeLoss} - V_{PrimeTubing})$$

The Prime Tubing Volume ($V_{PrimeTubing}$) is approximately 3.5 – 4.0 mL (determine based on supplied tubing.)

The Prime Loss Volume ($V_{PrimeLoss}$) required is 3.5 mL minimum. It is suggested to add 0.5 mL to your Prime Loss Volume, to ensure that the line is filled through the needle.

NOTE If the line is not filled sufficiently, the sample volume will be inaccurate as air will be delivered as part of the desired sample volume.

Example 1:
$V_{PrimeLoss}$ = 4.0 mL (programmed in system)
V_{Filter} = 3.0 mL
$V_{PrimeTubing}$ = 3.5 mL
$V_{SampleMax}$ = 3.0 mL − (4.0 mL − 3.5 mL)
$V_{SampleMax}$ = 2.5 mL

Calculation of Filter Outer Volume

The outer volume of the filter ($V_{FilterOut}$) can be calculated as follows:

$V_{FilterOut} = V_{FilterTotal} - V_{FilterMembranes}$

The total volume of the filter ($V_{FilterTotal}$) is:

$V_{FilterTotal} = \pi \times r_1^2 \times l_{FilterEffective}$

r_1= internal radius of the filter

$l_{FilterEffective}$ = effective length of the filter

The volume of the filter membranes ($V_{FilterMembranes}$) is:

$V_{FilterMembranes} = (\pi \times r_2^2 \times l_{FilterEffective}) \times n_{FilterMembranes}$

r_2= radius of the filter membrane

$l_{FilterEffective}$ = effective length of the filter

$n_{FilterMembranes}$ = total number of membranes in the filter

Insufficient Sample

The following actions are suggested if there is insufficient amount of sample:

Table 2 Suggested actions in case of insufficient amount of sample

Observed Problem	Suggested Actions
Insufficient sample amount	Preconditioning • Increase the Peristaltic Pump time in the **Method Parameter** tab. Prime Cycle • Reduce Prime Volume to transport more material from the filter into the needle. Alternatively, set the Prime Loss Volume to 0 for the same effect.

Filter Overfill or Insufficient Filling During Sampling

The following actions are suggested if the filter is overfilled or there is insufficient filling during sampling:

Table 3 Suggested actions in case of filter overfill or insufficient filling during sampling

Observed Problem	Suggested Actions
Insufficient filling	Set Syringe Overlap to 0 and increase the Peristaltic Pump speed.
Filter overfill	Increase Syringe Overlap time to maintain filter volume within a controllable range. Review the Peristaltic Pump speed.

Strong Surfactant Media (e.g. > 5% SDS)

The following actions are suggested when using media with a high surfactant concentration (e.g. > 5% sodium dodecyl sulfate).

Table 4 Suggested actions in case of media with high surfactant concentration

Observed Problem	Suggested Actions
Foaming within lines or filters	Reduce Peristaltic Pump speed, using the manual controls of the Peristaltic Pump. Increase pump times proportionally, using the **Method Development** tab in the Dissolution Workstation.
Foaming in syringes	Reduce plunger speed, using the **System Configuration** tab in the Dissolution Workstation. Increase aspiration dwell time in the 850-DS Autosampler, using the **System Configuration** tab in the Dissolution Workstation. It is possible to reduce the **% surfactant required** while increasing the **Method rpm** to overcome foaming issues.

NOTE

Increased noise
The 850-DS Autosampler may generate increased noise when using lower plunger speeds. This is normal behavior.

Filter Care

Filter Conditioning

Condition the filters before using or storing them. For information about recommended volumes and media for filter conditioning, refer to the documentation of the filter manufacturer (e.g. filter care guides).

Filter Cleaning

Create a cleaning method and use it after the analysis (post analysis). Use extended purge volumes and outer rinse cycles, ensuring that sufficient volume is sampled through the needles. Replace the vessel media and rinse media for this method.

Technical Support and Further Information

For technical support, contact **dissolution.hotline@agilent.com**.
Visit the Agilent Technologies website for useful information, support, and current developments about the products and technology:
https://www.agilent.com/en/product/dissolution-testing/dissolution-apparatus/nanodis-system

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