BioSurface Technologies, Corp.

Operating Instructions

BST FC 270/271/274/275 Flow Cell

The models FC 270/271/274/275 flow cell designs are based on the FC71 but accommodates two growth channels. This design allows biofilms to be grown side by side for duplicate or "control – treatment" experiments. Biofilms growing in each channel can be easily compared microscopically by simply moving the microscope stage backwards or forwards. The body of the flow cell consists of a polycarbonate or anodized aluminum flow channel. Glass viewing ports allow reflected, fluorescent, and confocal microscopy of biofilm growth in the flow channels.

FC 271

Viewing Window

The viewing window consist of a no.2, 24x60 mm cover slip. The glass viewing window is held in place by an aluminum cover plate. The cover plates also compress the silicone rubber gasket to provide a leak-proof flow cell.

Coupons

Each flow channel has been recessed to accept standard FC71 coupons : (6x25x2 mm); three 10 mm diameter x 2 mm thick circular coupons (as shown in picture); or two ½ inch diameter x 0.15 inches thick (same coupons as used in the CDC and RDR Biofilm Reactors) so multiple or replicate surfaces can be monitored.

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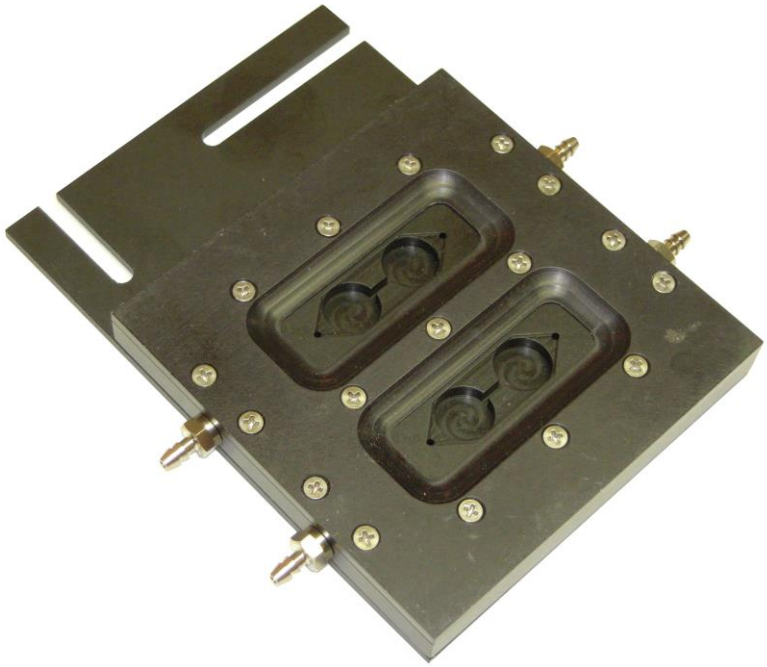
Injection ports

The FC271 and 275 flow cells come equipped with two fully autoclavable injection ports which may be used for inoculation, the addition of microscopy stains, or chemicals such as antimicrobial agents etc.



FC 270-AL

FLOW CELL ASSEMBLY AND OPERATION

It is very important the flow cells be assembly properly to provide a leak-proof seal.

Disassembly:

1. Remove the screws holding the cover plate in place.
2. Remove the cover plate. (Most likely the gaskets and glass viewing ports will remain with the cover plate).
3 Carefully remove the glass cover slip from the gasket material. Removal of the gasket from the cover plate may aid cover slip removal from the gasket. If the cover slip is broken, remove and discard these items.
4. Carefully clean the gasket surface, removing all glass and other debris. **It is very important no residual material be left on the gasket or cover plate surface.**
5. Clean the polycarbonate or anodized aluminum flow channel. **Do not scrub or mar the glass/flow channel mating surfaces.**

Assembly:

1. Carefully position a clean, unbroken cover slip in the shallow recessed slot on the flow channel. It is very important the cover slip be properly positioned in the

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recessed slot. **Improper placement will result in cover slip breakage upon tightening the cover plates.**

2. Carefully position the clean gasket on the other cover plate (plate with recessed beveled screw holes). Align the screw holes in the gasket and the cover plate.
3. Put several screws through the beveled holes on the cover plate (center) and through the holes on the gasket. These screws will help hold the gasket in place as it is placed onto the flow channel, and align the cover plate onto the flow channel (it helps to wet the gasket so it adheres to the cover plate).
4. Carefully place the cover plate with gasket onto the flow channel. **It is very important the cover slips remain properly positioned in the recessed slots (improper placement will result in cover slip breakage and or leaking).** **[**Screws inserted into the cover plate while installing the cover plate will help align the plate as it is lowered onto the cover slip and flow channel. Do not move the cover plate once it has contacted the cover slip, as the cover slip will move out of the channel, resulting in breakage upon tightening the screws.]
5. Place the screws into the beveled screw holes and tighten evenly around the perimeter, alternating sides as the screws are tightened.
   It is important the screw holes in the cover plate align with the holes in the gasket material. Improper alignment may result in leakage.
6. Install tubing on the tube ports and pump liquid through the flow cell to confirm a liquid tight seal.

AUTOCLAVING INSTRUCTION

The FC 270 series Flow Cells are completely autoclavable.

BioSurface Technologies recommends always using the slow (liquid) exhaust option. The screws holding the cover plates on the flow cell should be loosened to allow for material expansion. Tubing connected to the flow cell should allow free exchange of steam with the surrounding environment. BST recommends using a gas permeable material to cover the tubing ends such as autoclave paper instead of a gas impermeable material, such as tin foil. Slowly tighten the screws as the flow cell cools or wait until the flow cell is completely cooled before tightening the screws.

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TROUBLE SHOOTING

Problem: Glass viewing ports keep breaking:
Solution:

- Check to ensure the glass is properly positioned in the recessed slot.
- Ensure the gasket surfaces and flow channel mating surfaces are total free of debris.

Problem: Flow cell leaks.
Solution:

- Tighten screws further to compress gasket.
- Make sure flow channel and hose barbs are free and clear of obstructions.
- Make sure glass viewing ports are not cracked or broken.
- Check gasket for rips or tears. Clear of all debris. Replace as necessary.
- High flow rates may create too much back pressure to contain leakage. Reduce flow rate. **The flow cell is designed for a maximum flow rate of 3.5 ml/minute.**

If you have any questions concerning the FC 270 Series Flow Cell, please contact BioSurface Technologies Corporation at (406) 585-2812.

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