



Tech Report 200:

Use of Water Traps and Drying Filter with the FX-5000™ Tension System

Water Trap and Drying Filter Tech Report, Rev 2.0

Culturing Cells in a Mechanically Active Environment™
Flexcell International Corporation • 437 Dimmocks Mill Road, Suite 28 • Hillsborough, NC 27278
800-728-3714 • (919) 732-1591 • FAX: (919) 732-5196 • www.flexcellint.com

COPYRIGHT © 2009 FLEXCELL® INTERNATIONAL CORPORATION



WATER TRAPS

PURPOSE

The water trap provided with the FX-5000™ Tension System is used to remove moisture from air that cycles through the *FLEX IN* and *FLEX OUT* vacuum lines. On any given cycle, the FX5K™ Tension FlexLink® may draw air from the incubator through small leaks in the BioFlex® baseplate gaskets. As the incubator air is at a very high humidity, this can result in moisture accumulation in the *FLEX IN* and *FLEX OUT* tubing. The water traps collect water and effectively dries the air before it passes into the FlexLink®, and subsequently into the valves and transducers inside the equipment. They also serve to collect any condensed water that may have otherwise been vacuumed into the unit.

COMPONENTS

The water traps consist of an inline filter with a collection bulb enclosed in a black protective metal body. The filter removes moisture from the air and allows dry air to pass through to the FlexLink®. Removed moisture condenses and collects in the bulb below.

SPECIFICATIONS

Fitting Size: ¼" NPT (fittings supplied)
Max Airflow Rate: 53 CFM (1500 L/min)
Max Pressure: 150 psi (1 Mpa)
Max Temperature: 125 F (51 C)
Collection Bulb Volume: 2.2 oz (65 mL)
Bulb Material: Polycarbonate with guard
Height: 6.58 in (16.7 cm)
Width: 1.97 in (5 cm)
Weight: 1.25 lb (0.57 kg)

ASSEMBLY NOTES

The water traps come fully assembled with an inline connector fitting on each side. After the system is fully assembled, the water traps will need to be connected inline with the *FLEX IN* and *FLEX OUT* tubing (about halfway between the BioFlex® baseplate and FlexLink®). The water traps should be mounted to a solid surface using screws or cable ties, in a vertical position to assure that water will drain to the bottom of the bulb. The water traps should also be mounted in a position lower than that of the FlexLink®. This will force all condensed water to drain down into the bulb. When mounting, leave enough room underneath the bulb of each water trap to allow water collection through the valve at the bottom. The airflow direction required for the water traps should also be taken into consideration when mounting. Each water trap will have two stickers on top indicating which side should connect to the tubing that leads to the baseplate, and which side should connect to the tubing that leads to the FlexLink®. Use the stickers as indicators when connecting the trap inline. Before connecting the water traps inline with the *FLEX IN* and *FLEX OUT* tubing, set up the entire FX-5000™ Tension system. Locate a convenient position to mount the traps according to the prescribed conditions above. Cut the *FLEX IN* and *FLEX OUT* tubing at this point and connect the tubing to the two side ports of each water trap. The water traps are now ready for use with the FX-5000™ Tension System.

MAINTENANCE NOTES

During normal use of the water traps, some water may collect in the bulb of the water



traps. The amount of water that collects in the water traps will vary depending on how well the BioFlex® baseplate and gaskets are sealed in the incubator. An almost perfect seal will produce minimal water in the water traps. To improve the seal, vacuum or silicone grease can be used on the gaskets, and a lead weight and the Plexiglas® window provided with the system can be used on top. Over time, the gaskets will become more flexible, and the seal will improve. The water traps should be monitored hourly during initial use of the system to determine how much water accumulates over a given time period. This will allow the user to predict how often the traps should be emptied in future experiments. Once the water traps are nearly filled with water, the FX-5000™ Tension system should be paused or stopped in order to empty the water traps. *Normal use with a*

good baseplate seal will not require the stop of experiments in order to empty the water traps. To empty a water traps, place a cup or other collection container underneath and turn the valve at the bottom of the water traps bulb. This will allow the water to drain out. Once the water is drained, close the valve on the bottom of the water traps.

REPLACEABLE ITEMS

The water traps provided with the FX-5000™ Tension system should function properly throughout the lifetime of the system. Should any moisture be noticed passing through the water traps and condensing in the tubing on the FlexLink® side of the water traps, a replacement filter may be needed. Contact Flexcell® to order a replacement filter.

DRYING FILTER

PURPOSE

The drying filter is provided to remove moisture from the FX5K™ Tension FlexLink® system should any moisture have bypassed the water trap. This filter is necessary when water appears to have reached the internal components of the FlexLink® by way of the *FLEX IN* or *FLEX OUT* tubing. It can also be used on a semi-regular basis to perform preventative maintenance on the FX5K™ Tension FlexLink®. The drying filter functions by pulling air through desiccant beads and subsequently through the FlexLink® valves and transducer tubing. The dry air entering the FlexLink® removes moisture from the internal components and expels it through the system *VENT* port.

COMPONENTS

The drying filter consists of a small white bulb with desiccant beads, attached to a “T” fitting and tubing that adapts to the *FLEX IN* and *FLEX OUT* ports of the FlexLink® unit. The bottom of the drying filter has an orange plug which must be removed in order to allow air to be drawn through the unit.

SPECIFICATIONS

Fitting Size: ¼” NPT female inlet with male outlet (fittings supplied)
Max Airflow Rate: 15 CFM (425 L/min)
Max Pressure: 125 psi (0.86 Mpa)
Max Temperature: 130 F (54 C)
Pore Size: 40 micron
Dimensions: 3 ¾” x 1 11/16” diameter (9.5 cm x 4.3 cm)



Weight: 0.25 lb (.11 kg)

ASSEMBLY NOTES

The drying filter comes fully assembled with connector fittings that adapt to the *FLEX IN* and *FLEX OUT* ports on the back of the FlexLink®. To connect the drying filter to the FlexLink®, first remove the *FLEX IN* and *FLEX OUT* tubing from the back of the FlexLink®. Connect the blue polyethylene ¼" OD tubing from the drying filter to the *FLEX IN* port on the back of the FlexLink®. Connect the clear vinyl 3/8" OD tubing from the drying filter to the *FLEX OUT* port on the back of the FlexLink®. Remove the orange plug in the bottom of the drying filter. The drying filter is now ready for use with the FX-5000™ Tension System.

RUNNING THE FX-5000™ TENSION SYSTEM WITH THE DRYING FILTER CONNECTED

With the drying filter connected and the orange plug at the bottom removed, open the FX-5000™ software. In the *Regimen* menu of the main window display, select *Assign*. Choose the *BioFlex Plate, no Loading Stations* platform assignment, the *Shutdown* username, and the regimen entitled *Drying*. Once the regimen is assigned, press *Start*. Be sure that the vacuum source is turned ON. The sound of air cycling through the drying filter can be heard. Once the regimen is complete, the drying filter should be removed and replaced with the *FLEX IN* and *FLEX OUT* tubing from the BioFlex® baseplate.

If it is believed that a significant amount of water may have entered into the FlexLink®, a longer drying regimen may be programmed into the software. To do so, simply modify the time in the default regimen *Drying*. In many cases, if a large

amount of water has entered into the FlexLink®, the unit will need to be shipped to Flexcell® for repair.

MAINTENANCE NOTES

After one or more uses of the drying filter, the desiccant beads will begin to change color due to saturation from the moisture passing through. This indicates that the drying filter efficiency has decreased, although its functionality is still intact. Once the beads have changed colors, the filter should be placed in a drying oven before use in order to dehydrate the beads for greater drying efficiency. The recommended oven conditions are 50°C (122°F) for 1 hour. After repeated use, a replacement filter may need to be purchased.

REPLACEABLE ITEMS

The drying filter can be replaced regularly at a reasonable expense. It is recommended that this filter be replaced if regular experience of water condensation problems with the FX-5000™ Tension System occurs. Regular maintenance of the FX-5000™ Tension System is important to maintain longevity. Contact Flexcell® for information on purchasing a replacement drying filter.