

Fluid Lines 101

Table of Contents

01

Introduction

02


Cleaning Fluid Lines

05

How to Remove
Silicone Tubing from
Fluid Line

06

Tubing Options for
Fluid Line



Fluid Lines can be added to U, V, and S-Probes to allow for drug delivery.

Introduction

This document provides information on properly cleaning fluid lines, tips on clearing clogs, and additional details on tubing for fluid lines.

Cleaning Fluid Lines

Protocols from Probe Technical Guide

It is important when utilizing a probe with a fluid capillary to test the capillary before the first use. When a fluid capillary probe is first received, wash it by pushing distilled water through the capillary. Then blow air through the capillary. The air will help dry the capillary and remove any remaining fluid. After each use of the probe, immediately wash the capillary by pushing 95% alcohol through followed by at least 20mL of air. The air will help dry the capillary and remove any remaining fluid. **Lastly, never leave alcohol in the capillary for more than several minutes as this runs the risk of dissolving or damaging the epoxy.**

Cleaning Instructions

Step 01

First prepare two sets of inlet tubes (one for air cleaning and one for fluid cleaning) by attaching an inlet tube to a hypodermic needle. The fluid going into the probe has to be distilled water or isopropyl alcohol based solution without solids (i.e. water soluble or isopropyl-soluble).

Step 03

Fill one of the prepared tube/needle and 5 - 10mL syringe with a combination of distilled and filtered water for use with cleaning.

Step 05

Run a generous amount of water through the tube.

Step 02

Upon completion of the recording(s) and injection(s) with the Probe, gently pull the probe out of the brain and dispense any remaining drug solution.

Step 04

Remove the inlet tube used for drug delivery from the electrode and attach the cleaning tube to it.

Step 06

Remove the fluid cleaning tube from the electrode and force air from the second prepared tube/needle set until only air remains.



These steps can be viewed on this video.

Tips From the Field on Cleaning and Clearing Clogged Fluid Lines

The purpose of this section is to share information that we have gathered from other researchers for reference and analysis. It is essential to note that inclusion in this document does not imply approval or endorsement by Plexon.

Tip 01

If the clog is close to the tip: While using high pressure to flush the capillary with alcohol try placing a soldering iron of 200 °C to the metal part of the tube. This sometimes helps to remove the clog.

Tip 02

Try touching a vibrating depurator (dentists use it for removing tartar from teeth) to the metal along the tubing.

Tip 03

Try flushing the capillary with alcohol using high pressure -- alternating pressure and suction -- followed by blowing air through in order to dry everything and avoid leaving any remaining fluid residue behind.

Tip 04

Some groups have had success leaving the probe tip submerged in an ultra-sonic cleaner. This can sometimes dislodge whatever it is that's clogging the probe.

Tip 05

The main thing is just getting the probes cleaned immediately following each procedure. I use this protocol.

1. Attach a DI water-filled syringe to the fluid input and apply steady constant pressure to clear the fluid line.
2. Attach an air-filled syringe to the fluid input and press until bubbles stop forming.
3. Sonicate with metrizyme and clean the probe like you would any other probe.
4. Repeat steps 1 & 2 if you want to be safe.

Tip 06

Certain fluids seemed to be bad for the probes as well. For example, the blue tissue dye we used a couple times for marking probe location clogged the probe we tried it out with.

Tip 07

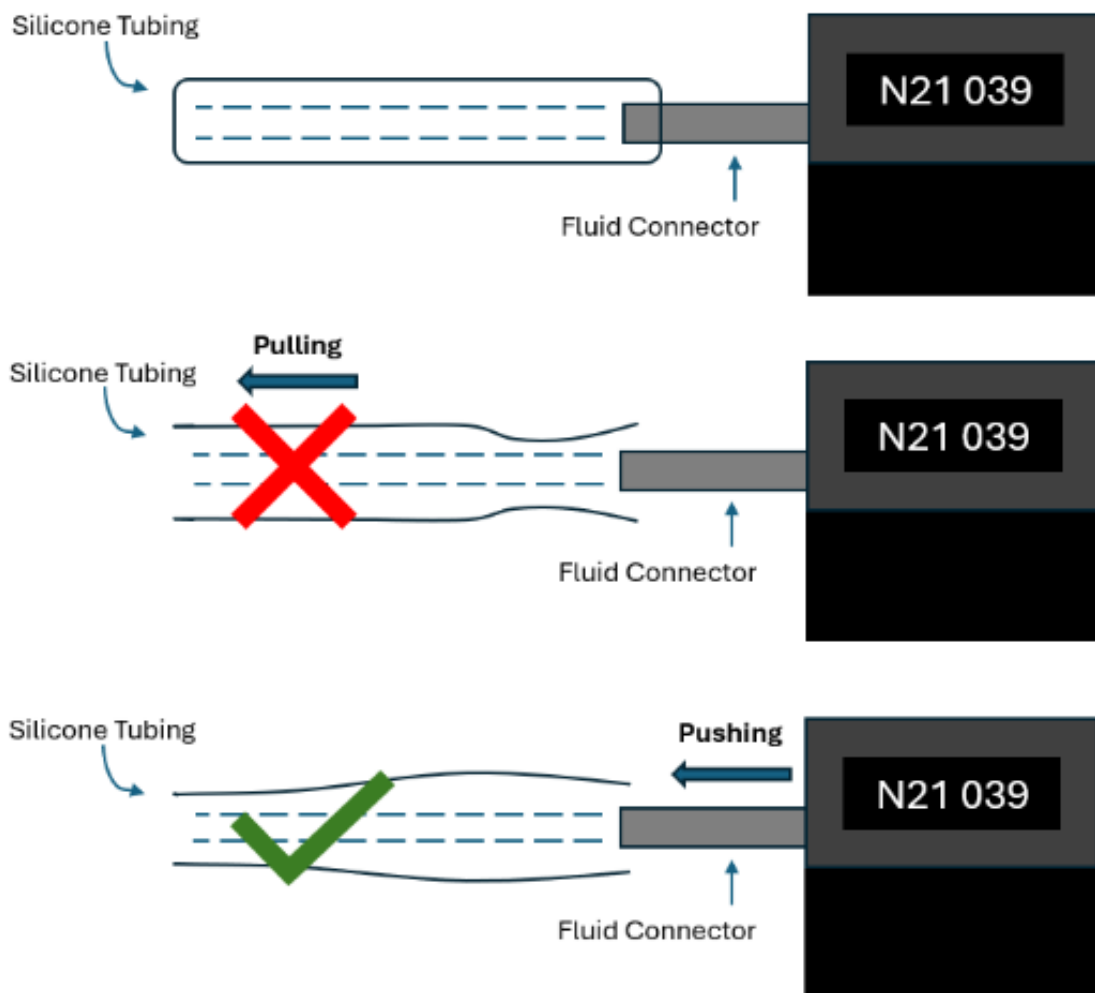
I have de-clogged probes before but it doesn't always work. The procedure for that is just pulsing pressure on the syringe plunger after soaking in metrizyme/sonicating. Definitely not easy to de-clog in my experience, though.

Tip 08

I have to be religiously diligent with cleaning/flushing both before and after use/storage. Once a channel is clogged, I will typically try to unclog by flushing, soaking the tip in enzymatic detergent and pushing fluid/air, or sonicating the tip while pushing air/water/alcohol. Or often a combination of these three. These techniques work sometimes. But often once there is a clog, it cannot be undone.

How to Remove Silicone Tubing from Fluid Line

Some customers have damaged the fluid line while trying to remove the silicone tubing. Please see the image below that shows the best process for removing the tubing from the fluid connector. The silicone tubing should be pushed off rather than pulled.



Tubing Options for Fluid Line

When testing probes prior to shipment, Plexon uses silicone tubing with 300 μ m ID. It's easier to pull on the fluid line connector than the polyethylene tubing. Polyethylene tubing can be very tight and it tends to tear or split when pulling on the fluid connector. If the tubing tears, the damaged portion should be removed.

For labs that need to use polyethylene tubing, Insteclabs has a few options. From the Tubing Reference Chart we would propose for the labs to try polyethylene tubing Gauge 23 (540 μ m OD 330 μ m ID) or Gauge 24 (tighter with 560 μ m OD 300 μ m ID) or Gauge 25TW (510 μ m OD 300 μ m ID)



**Polyethylene
Tubing**