

# Why Risk Build Up of Bacteria...



Mar Cor Purification introduces

**MicroFree™ Tubing**

...Control Bacteria in Dialysis Loops

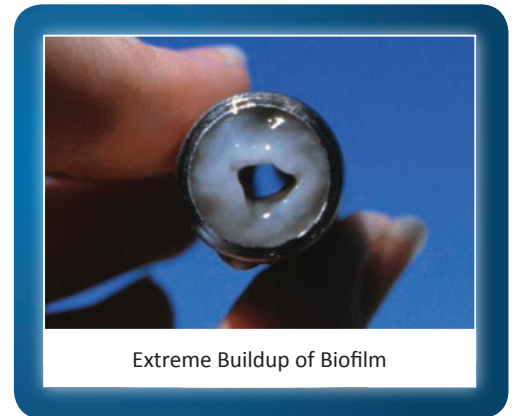


# Dramatically Reduce Biofilm Buildup ...

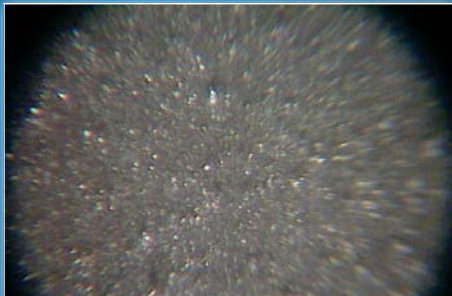
**De-chlorinated**, warm water environments will always support micro-biological growth. Uncontrolled biological growth will lead to the formation of biofilm in clinic distribution systems. The key is to use a design, materials and procedures that will minimize growth. Traditionally, clinics have used PVC piping systems. Although PVC was considered adequate in the past, current thinking is that PVC is not ideal for tighter bacteria control and it limits the type of sanitants that can be used. The reason for this is even properly installed PVC fittings can be susceptible to the development of biofilm.

**Biofilm** is the root cause of bacteria problems. Biofilm is a community of microorganisms covered with a protective layer of slime that can attach anywhere; dead legs are particularly susceptible. Once established, the microorganisms can flourish and resist disinfection. The key to control is maintaining conditions that reduce the formation of biofilm in the first place.

**MicroFree™** tubing as compared to PVC piping has a lower potential for buildup of biofilm because it has a lower surface tension for water, reducing opportunity for biofilm to attach. As a result, biofilm is more easily removed due to the smooth surface. Independent studies have demonstrated that Perfluoroalkoxy(PFA) has a higher resistance to biofilm buildup and is far easier to clean than other materials.



Surface Area of PFA Pipe



Surface Area of PVC Pipe

## MicroFree Tubing vs PVC Piping

As these two images show, PVC surface is relatively rough, providing increased areas for biofilm to attach. PFA tubing is much smoother, reducing areas for growth and providing a lower pressure drop.

## MicroFree Tubing Advantages

- Smooth wall prevents biofilm buildup
- Smooth wall reduces pressure drop, saving energy
- Up to 75% faster rinse out of chemical sanitizers
- Fewer and cleaner fittings/couplings
- Compatible with all approved sanitization methods
- 510(k) Regulatory recognition
- Specially designed light-blocking shield
- 50% faster installation over typical PVC material
- Zero Dead Leg (ZDL) wall box connection

# ... Choose MicroFree Tubing

## MicroFree PFA Tubing can Be Used in Both

- Dialysis Clinic Water Distribution Systems
- Dialysis Clinic Bicarb Distribution Systems

MicroFree piping systems can be used where ever liquids need to be conveyed in a dialysis clinic.

Product Attribute	MicroFree	Stainless Steel	PEX	PVC
Surface Smoothness	Excellent	Good	Good	Poor
Installation Time	Quick & Easy	Time Consuming	Quick & Easy	Time Consuming
Chemical Rinseout Time	Short	Average	Average	Long
Approved Sanitant Compatibility	All	Most	Most	Few
Biofilm Buildup Resistance	Excellent	Good	Good	Poor

## MicroFree Tubing is the clear choice

### MicroFree Tubing vs PVC Piping

- PVC surface is relatively rough, providing increased areas for biofilm to attach.
- PFA is much smoother, reducing areas for growth and providing a lower pressure drop.
- Glued PVC joints can be irregular and have gaps between surfaces.
- PFA joints are designed to minimize buildup of biofilm.



MicroFree Specially Designed  
Light-Blocking Shield



MicroFree joint connection showing its smooth-walled connection.



Cross section of PVC joint connection showing recessed wall cavity at joint.



MicroFree Joint close-up of PFA connection showing a smooth, gap free surface.



PVC Joint close-up of gap that can be created at joints, allowing for build up of biofilm.

# Mar Cor Purification **MicroFree** Tubing



Cleaner 90° Angles w/ Light Shield Installed



Seamless Connections Between PVC



MicroFree  
Zero Dead Leg (ZDL)  
Wall Box Connection



## Assured Performance

### Proven Results

PFA piping systems are well proven. The Pharmaceutical and Semiconductor industries, who lead in “clean” design, have been using PFA for years. These industries use a strategy of sanitary design, dead leg elimination and preventive sanitization to control biofilm. MicroFree piping systems place that same technology into dialysis clinics.

### Flexible Sanitization Options

MicroFree PFA Tubing is compatible with the following sanitation methods:

- Hot Water
  - PFA piping can be used with hot water disinfection procedures. Up to 100 psi and 185°F.
- Minncare® Cold Sterilant
- Bleach
- Ozone

### Standards

PFA piping materials are accepted by the Centers for Medicare and Medicaid Services (CMS) for use in dialysis piping distribution loops. It also meets the following standards:

- FDA/USDA
- US Pharmacopoeia Class VI
- 3-A sanitary standards
- National Fire Protection Association Life Safety Code 101

### Installation Qualification

Factory trained and certified installation staff specializing in the installation and maintenance of teflon distribution systems.

## Mar Cor Purification, Inc.

The focus of Mar Cor Purification is to deliver proven filtration and infection control technology, supply high-quality equipment for ultrapure water applications, and provide reliable customer service that is unsurpassed in the industry. As a global company, we are committed to serving the needs of our customers worldwide. With over 75 years of company experience and backed by our parent company, Cantel Medical Corp., Mar Cor Purification is ideally suited to lead the way in the filtration, water, and disinfection technology marketplace. For more information visit us on the web at [www.mcpur.com](http://www.mcpur.com).

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