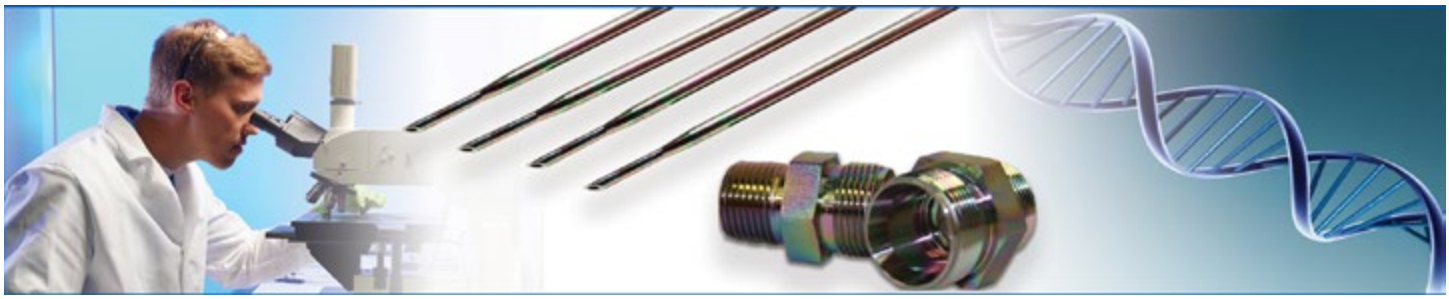
Bio-Inert Coatings for Medical Devices



Medical devices and diagnostic instruments often rely on polymer coatings for a metal-free surface, but these materials are susceptible to corrosion, carryover, and damage that threatens compatibility and performance.

SilcoTek's coatings help OEMs create durable, high-performance products with low maintenance costs.

Introduction

Medical device manufacturers have to constantly balance regulation and logistics with a growing demand for next-generation products. However, OEMs struggle to realize innovation in their products without drastically driving up costs.

Popular materials of construction for devices and diagnostic instruments fail to provide the performance required for the end user's ideal workflow. Corrosion from bleach cleanings, frequent maintenance caused by protein carryover, and worn componentry threaten output and profitability.

SilcoTek® provides advanced coatings that make devices and instruments last longer, work faster, and perform better.

The chemical vapor deposition (CVD) process creates a nano-scale silicon-based coating that resists attack better than stainless steel with functionality and durability that significantly outperforms fluoropolymers. The coating is NSF certified and compliant with FDA regulations.

Material Challenges in Medical Device Manufacturing

•**High costs from corrosion and wear**: even stainless steel degrades and threatens the safety of products, especially when bleach is commonly used for cleaning

•**Frequent maintenance**: proteins, blood, and other bio-media readily adsorb onto metal surfaces, requiring manual maintenance, component replacement, and long delays

•**Poor reliability**: metal ions from device and instrument flow paths leach into process streams while polymer coatings can easily flake or delaminate, causing upsets and false results

Problems Solved by SilcoTek® Coatings

- Poor performance caused by carryover of proteins
- High costs due to corrosion, especially from bleach
- Contamination from leaching of metal ions out of equipment
- Poor analytical sensitivity for challenging samples
- Recurring replacement because of material wear

Applications where SilcoTek® Coatings Boost Performance

- Immunoassay analysis
- IVD
- Consumable storage/disposal
- Liquid chromatography
- Implants
- Multi-functional

Common Parts that Benefit from SilcoTek® Coatings

Needles	Probes	Sensors
Tubing	Cannulas	Mandrels
Guide Wires	Surgical Tools	Tips and Dies

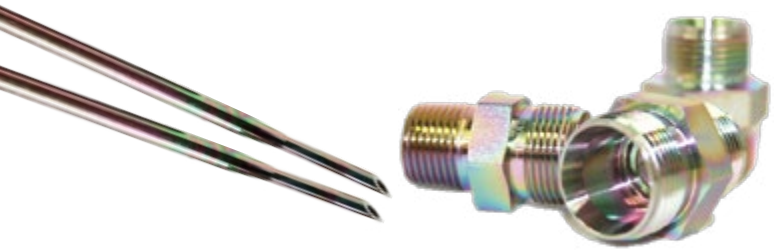
Visit **SilcoTek.com/blog** and subscribe for weekly coating resources, news, and updates.

Advanced Surfaces for Advanced Performance

SilcoTek's patented coatings provide numerous advantages over alternatives, giving medical device and instrumentation manufacturers ultimate performance along with flexibility in system design, fabrication, and installation.

1. Innovative Deposition Process Makes Integration Easy

The gas-phase CVD process binds the coating to the molecular structure of the base substrate, leading to a flexible layer that can bend without flaking like PTFE or other polymers. Plus, challenging geometries and narrow internal passageways can be thoroughly coated with ease.

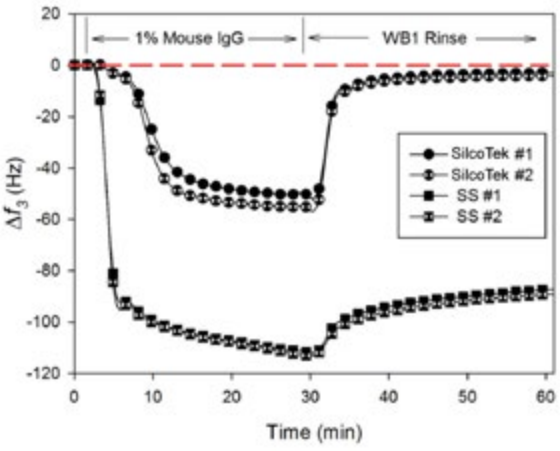


SilcoTek improves parts made of stainless steel, ceramics, glass, and more, even those with complex geometries or high aspect ratios.

2. Low Surface Energy Prevents Protein Carryover

Preventing adsorption of proteins onto device surfaces is highly desirable in the medical industry. SilcoTek's coatings provide a robust, low energy surface that prevents proteins and other media from sticking. This improves analytical sensitivity and accuracy and while significantly increasing sample throughput.

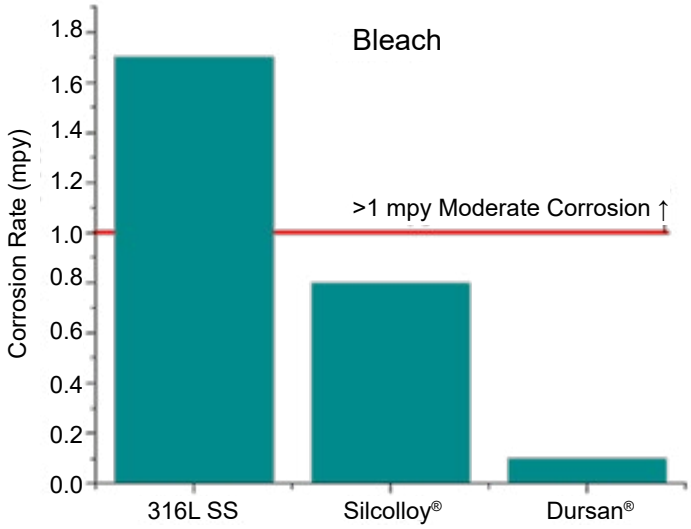
When compared to common solutions like fluoropolymers, SilcoTek-coated stainless steel offers both better protein resistance as well as durability to withstand common cleaning and maintenance procedures.



[1]SilcoTek® coatings enable better diagnostic results and decrease maintenance by greatly reducing protein sticking.

3. Superior Corrosion Protection for Longer Usable Life

SilcoTek® coatings substantially improve the corrosion resistance of stainless steel and other alloys, prolonging usable device lifetime while helping to maintain sanitation.



SilcoTek® coatings (right) allow the use of concentrated bleach without any of the corrosion issues that are common with bare stainless steel.

Changing the Game in Medical Device Manufacturing

Working with SilcoTek is a unique service experience that puts customer solutions and quality first. This drives an endless commitment to providing fast, high-quality, mistake-free coatings every day. Let SilcoTek's coating services be the greatest asset to your medical device supply chain.

Resources

Visit **www.SilcoTek.com/learning-center** for literature, data, and more.

How to Buy

Go to **www.SilcoTek.com/ordering/quote-request** for a custom quote or **www.SilcoTek.com/buy-coated-products** for stock items.

Contact SilcoTek

Find a global representative: **www.SilcoTek.com/ordering/international**

For customer or technical service: **SilcoD@SilcoTek.com**

By phone: **+1 (814) 353-1778**

[1] Vaidya, S., Yuan, M., Narváez, Daghfal, D., Mattzela, J., Smith, D. "Protein-resistant properties of a chemical vapor deposited alkyl-functional carboxysilane coating characterized using quartz crystal microbalance." Published in Applied Surface Science. December 2015.

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