Coatings that Expand Material Limits™

SilcoTek's patented coatings solve the most demanding material challenges found in energy, science, and technology industries.

Features

- Chemically inert
- Corrosion resistant
- Flexible, won't flake
- Thin (<1000 nm)
- Hydrophobic
- Easy to clean
- High temperature

Advantages

- 3D, non-line-of-sight process
- Significant cost savings over exotic alloys or materials
- Enables trace analysis required for regulatory compliance
- Easy to integrate from prototype to production

Benefits

- Improve system efficiency and uptime
- Decrease maintenance
- Increase productivity
- Save money

SilcoTek®

Innovative surface coatings that make the impossible possible

Bring robust corrosion resistance and chemical inertness to the molecular level of stainless steel, glass, ceramic, and other substrates.

FOR CHEMICAL ANALYSIS

SilcoTek's silicon-based coatings are specially tailored for inertness (non-reactivity) to highly active chemical compounds. Required for analyzing trace levels of sulfurs, mercury, emissions, pesticides, etc.

SilcoNert® is the industry-preferred coating for highly sensitive sampling and analysis applications. Dursan® is a tough and versatile coating suited for harsh analytical environments. Modern chemical detectors and analyzers manufactured worldwide rely on these inert coatings to give accurate results.

FOR CORROSION PROTECTION

Protect critical investments in a wide array of corrosive environments. SilcoTek's dense, pinhole-free coatings provide a uniform, molecularly-bonded barrier between substrate and flow path.

Dursan includes oxygen and carbon in the base silicon layer for a ceramic-like, durable, and highly corrosion resistant coating. Suited for pH 0-14 and harsh corrosives like HCl, H_2SO_4, bleach, and more. Silcolloy® adds significant potential lifetime to parts in oxidative environments. Bring exotic alloy performance to stainless steel for a fraction of the cost.

FOR HIGH PURITY

Prevent leaching of metal ions from stainless steel equipment into critical process streams while increasing system uptime. Imperitive in sensitive manufacturing environments e.g. semiconductor.

Silcolloy offers oxidation, chemical, and corrosion protection even at temperatures as high as 1000° C. Dursox™ is a silica-like coating with exceptionally low surface energy and high durability. SilcoGuard® greatly reduces outgassing in high vacuum applications. All three coatings provide better equipment lifetimes and higher product yields to companies with strict purity requirements.

CHOOSING THE RIGHT COATING

Customers should work with SilcoTek's technical experts to help them select the best coating for their application. Some applications require a very specific treatment whereas any SilcoTek coating could work for others. SilcoTek's complete line of coating solutions offers a multitude of surface properties in addition to what's highlighted above:

- Low surface energy
- Anti-coking/anti-fouling
- Hydrophobicity
- Abrasion resistance
- Easy cleaning/anti-stick
- Low outgassing

The recommendation process often involves samples, testing at both customer and SilcoTek sites, technical consultation, visits, and more. The SilcoTek service experience couples technical expertise with coating capability and performance to give customers a solution they (and their customers) can rely on.

Coating Properties

SilcoTek's innovative chemical vapor deposition (CVD) process introduces proprietary process gases into a special oven containing your parts. The gas penetrates torturous passageways and provides a thin, uniform coating even on complex part geometries.

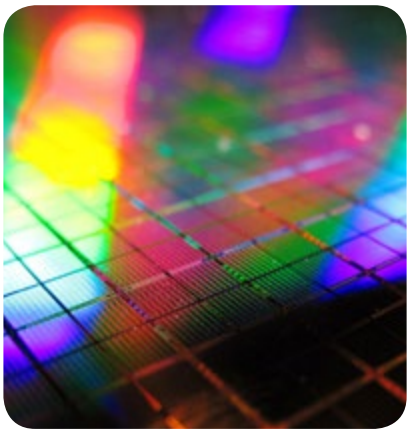
Each standard SilcoTek® coating is tailored to specific applications but can be used successfully in a wide variety of environments. Contact SilcoTek for coating recommendations.

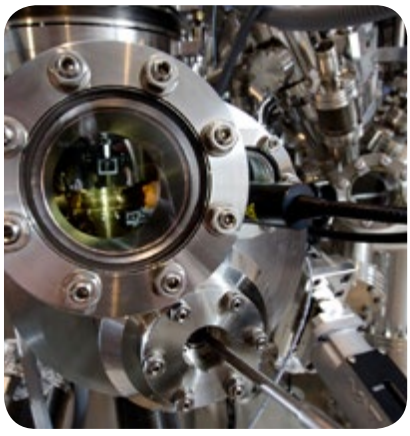
COATING	MATERIAL COMPOSITION	MAXIMUM TEMPERATURE	CONTACT ANGLE*	WHAT IT DOES
SilcoNert® Superior inertness	Silicon (functionalized)	450° C	99°	Makes surfaces non-reactive. A durable, high temperature alternative to fluoropolymers like PTFE or PFA.
Dursan® Corrosion and abrasion resistant, inert, low surface energy	Silicon, oxygen, carbon (functionalized)	450° C	119°	Provides low surface energy and excellent protection in very corrosive environments. Hydrophobic, 2x as wear resistant as stainless steel and easy to clean.
Silcolloy® Oxidation resistant, high temperature	Silicon	1000° C	54°	Protects parts from oxidation while preventing metal ions from leaching out of surfaces. Ideal for high temperature applications.
SilcoKlean® Anti-coking	Silicon (functionalized)	1000° C	90°	Prevents hot fuels and gases from coking or fouling on metal surfaces. Ideal for fuel transfer and exhaust gas applications.
SilcoGuard® UHV low outgassing, high purity	Silicon	1000° C	54°	Isolates materials trapped on or in metal surfaces and prevents them from entering ultra-high vacuum or other high purity environments.
Dursox™ Silica-like, ceramic	Silicon, oxygen** (functionalized) **<2% embedded carbon	450° C	<60°	Gives durabilty, moisture resistance, erosion and corrosion protection to processing equipment. Ideal especially for semiconductor manufacturing equipment.

*Evaluated on 120 grit, 58 rms (µin.) 300-series stainless steel

A Note on Thickness

SilcoTek's chemical vapor deposition (CVD) process has been optimized to produce surface coatings that meet the performance characteristics and material properties listed above, unrelated to thickness. All coatings are typically less than 2000 nm (2µm) thick.





Industries & Applications

Petrochemical

- Process analyzers
- CEMS
- Ethylene and propylene
- Refinery, flare, and stack gas
- ULSD/ULSG
- LNG and CNG
- Environmental sampling

Oil and Gas Exploration

- Well sampling
- Downhole tools
- Offshore instrumentation
- Odorant testing
- Wireline
- Power generation and distribution

Semiconductor Manufacturing

- Etch and deposition
- Epitaxy
- MOCVD and PECVD
- CMP
- OLED
- Ozone
- Moisture analysis

Aerospace and Automotive

- Fuel and injector nozzles
- Feed lines
- Fuel injectors
- Exhaust testing
- Exhaust gas recirculation equipment

Analytical

- Chromatography
- Needles and probes
- Vials
- Sample loops
- Ultra high vacuum
- Flow control
- Food and beverage analysis

Coatings that Expand Material Limits

Whether in the laboratory, plant, or field, SilcoTek's patented coating technologies provide advanced material solutions that save you time, increase your productivity and improve performance, all while lowering operating costs and protecting your critical investments.

SilcoNert® **Dursan®**

Silcolloy® **Dursox™**

SilcoKlean® **SilcoGuard®**

For more information, visit www.SilcoTek.com

Coating Use

All statements, technical information and recommendations contained in this document are based upon tests or experience that SilcoTek believes are reliable. However, many factors beyond SilcoTek's control can affect the use and performance of a SilcoTek coating in a particular application, including the conditions under which the product is used and the time and environmental conditions in which the product is expected to perform. Since these factors are uniquely within the user's knowledge and control, it is essential that the user evaluate the SilcoTek coating to determine whether it is fit for a particular purpose and suitable for the user's method of application.

Limited Liability

Except where prohibited by law, SilcoTek will not be liable for any loss or damage arising from the SilcoTek coating whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence, or strict liability.

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