

Corrosion Resistant, Anti-Oxidation

Increase material lifetime and improve performance

Silcolloy®1000 formerly Silcosteel®-CR

Silcolloy® improves corrosion resistance of stainless steel by up to 10x!

Economical protection against corrosion

Silcolloy1000 Industries:

- Semiconductor
- Offshore
- Oil & Gas Exploration
- Refining
- Petrochemical
- Energy

Silcolloy1000 Applications:

- process tubing, fittings, valves, and reactors
- gas transfer and delivery systems
- nozzles
- stack gas monitors
- analytical testing equipment in harsh environments
- etch and CVD equipment

Silcolloy®1000 is a proprietary (U.S. Patent #7,070,833), multilayer silicon, chemical vapor-deposited (CVD) coating, specifically designed to improve the corrosion resistance of steel, stainless steel, alloys, glass, and ceramics. The unique non line-of-sight CVD process produces a flexible amorphous silicon layer that diffuses into the metal lattice. The layer will conform to the most intricate surface while maintaining high dimensional tolerances. Silcolloy1000 will deform with tubing surfaces, allowing leak-free seals or radius bends.

Silcolloy® solutions:

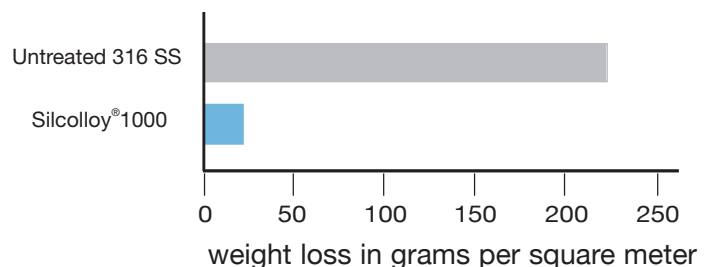
- Enhance yield
- Prevent corrosion
- Increase reliability
- Decrease maintenance

Independent Laboratory Testing

Silcolloy® 1000 offers an order of magnitude or more improvement in corrosion resistance relative to existing processes.

Corrosion testing of Silcolloy 1000 treated 316L stainless steel and untreated 316L steel according to ASTM G48, Method B2 (72-hour ferric chloride pitting and crevice corrosion testing), show corrosion of the treated stainless steel is reduced by an order of magnitude, as measured by weight loss (Figures 1 and 2).¹

Figure 1 Silcolloy 1000 treated stainless steel outperforms uncoated metal by an order of magnitude (ASTM G48, Method B). Testing courtesy of Matco Associates.

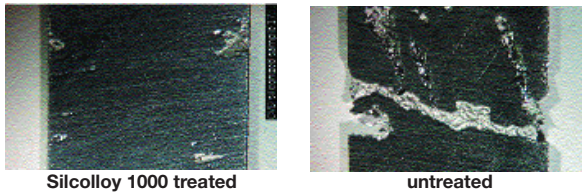


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Testing of Silcolloy 1000 treated coupons in neutral, acidic, and basic chloride solutions, according to ASTM G61,¹ shows Silcolloy 1000 treatment reduces corrosion rates by an impressive 50x, compared to untreated 316L stainless steel.

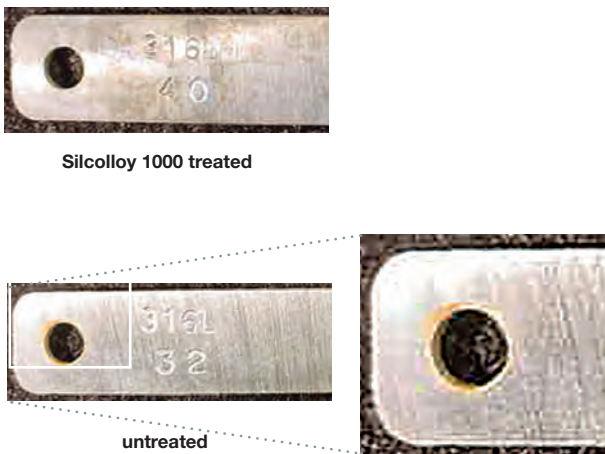
Figure 2 Silcolloy 1000 treated 316L stainless steel coupons show no crevice corrosion and only slight pitting corrosion; untreated coupons exhibit severe crevice corrosion. Testing courtesy of Matco Associates.



Improved Performance in Marine or Acidic Environments

Silcolloy 1000 treatment is effective in acidic or salt corrosive environments, in which the user demands extended service life for an existing process without using high-priced alloys. 4000-hour salt spray testing (salt spray accelerated weathering test ASTM B117) shows Silcolloy 1000 treated stainless steel coupons exhibit no surface corrosion, while untreated coupons show surface corrosion and accelerated corrosion at the coupon hole (Figure 4). Neither coupon developed pitting over the test period.¹

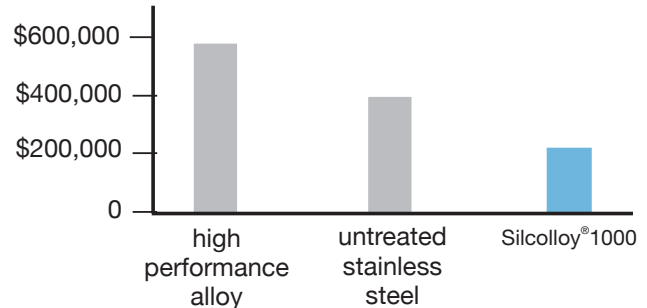
Figure 4 Comparison of estimated lifetime costs in a typical process system, shows Silcolloy 1000 treatment can reduce the overall lifetime cost of the system by hundreds of thousands of dollars.



Save Thousands with Silcolloy!

Estimated lifetime cost savings of a typical process system show Silcolloy treated sample lines, fittings and valves will save the user hundreds of thousands of dollars. While the initial cost of an unprotected stainless steel system is lower than a comparable Silcolloy 1000 treated system, the overall lifetime cost, considering replacement cost due to corrosion is nearly double that of a Silcolloy 1000 treated system (see figure 5). High performance alloy systems offer superlative corrosion performance, but the initial material cost can be up to six times higher than a comparable stainless steel system.

Figure 5 Silcolloy 1000 demonstrates significant cost savings, compared to untreated stainless steel or alloys (US dollars).



Summary

Silcolloy 1000 treatment has extended the life of process systems in semiconductor, oil and gas production, oil refining, petrochemical processing, aero-space equipment, semiconductor etch and deposition systems, and laboratory testing facilities worldwide.

Test data show that Silcolloy 1000 treatment is effective in extending the life of stainless steel process systems while reducing overall system maintenance cost. Because Silcolloy 1000 treatment can be applied to a majority of existing process components, process equipment life is extended without significant re-engineering.

References

1. M. Zamanzadeh; G. Bayer; G. Rhodes; D. Smith; M. Higgins; Laboratory Corrosion Testing of a Chemical Vapor Deposited Amorphous Silicon Coating; Matco Associates, Inc. Pittsburgh, PA; SilcoTek Corporation, Bellefonte, PA. 2005



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SilcoTek treatments are available worldwide!

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Step 1 - Get a quote!

We make it easy with quote options to fit your needs visit our website at www.SilcoTek.com and complete our on-line quote request form or fax your quote request to Quotes at 814.353.1778 or e-mail it to Silcod@SilcoTek.com. We'll get a quote out to you within 24 hours!

Step 2 - Send in your parts!

Mailing instructions, shipping labels and a service number will be forwarded to you along with your quotation. Box up your parts and send them to us. Your order will be processed in 15 working days or less.

Our 2 touch system means zero disappointments. We'll notify you when we receive your parts and when your order is ready to ship.



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