

Silcosteel®-UHV

Achieve faster pump-down times by greatly reducing outgassing

Ultra-high vacuum (UHV) environments are characterized as requiring a vacuum of 10^{-9} torr or lower. At 10^{-5} torr or lower, steel components outgas large quantities of moisture. Massive pumping systems are needed to remove molecules as they are released.

We developed Silcosteel®-UHV treatment to significantly reduce outgassing by steel components in UHV systems. A Silcosteel®-UHV layer over the steel surface keeps moisture isolated from the UHV environment, and does not liberate any atmosphere of its own. The data in Figure 1 demonstrate the superior evacuation profile sustained by using Silcosteel®-UHV treated components vs. non treated components in a UHV assembly. Clearly, Silcosteel®-UHV treatment makes it possible to maintain a UHV environment with much less pumping capacity. Further, when not under vacuum, the Silcosteel®-UHV surface is far less likely to accrue a coating of water and other airborne molecules than a nontreated surface. This greatly reduces the time required to re-attain a UHV environment. The durable Silcosteel®-UHV layer will withstand the sealing requirements of UHV, maintaining knife edge integrity.

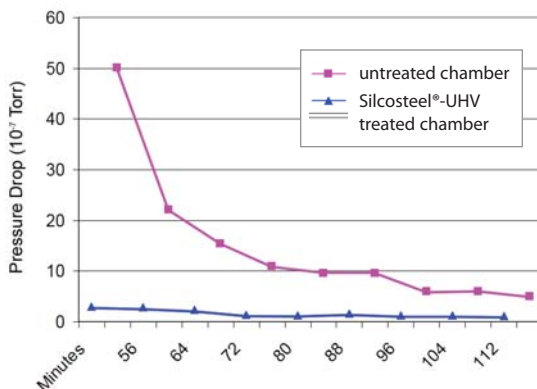
Silcosteel®-UHV treatment is available as a custom service—contact the Restek coatings experts.

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Figure 1 Silcosteel®-UHV treated ultra-high vacuum system components show significantly reduced evacuation times—within 80-84 minutes of initial evacuation, the coated chamber exhibits a 9.1-fold improvement in chamber base pressure.

Experimental setup: A common turbomolecular pump attached to two dimensionally identical chambers isolated by all-metal valves. One chamber is Silcosteel®-UHV treated (blue), the other is untreated (violet). Using valve switching, chamber vacuums are alternately measured during evacuation. The outgassing contribution of untreated valves and components are measured and mathematically subtracted to obtain corrected base pressures for each chamber.

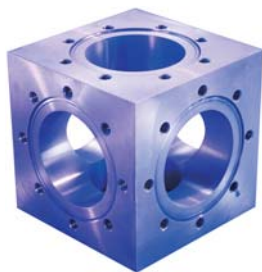


R&D 100 Award

Silcosteel®-UHV was recognized by a panel of independent judges and editors of *R&D Magazine* as one of the 100 most technologically significant products introduced in 2003.

RESTEK PERFORMANCE COATINGS

product guide



Silcosteel®-UHV is offered on a custom basis and is applied to your existing equipment—see page 398.

- UHV chambers
- Tubing and piping
- Conflat flanges
- Fittings
- Valves
- Pumps

