

Cold Shot Chillers



INORGANIC PROTECTIVE COATINGS



- Extend Equipment Life
- Improve Long-Term Unit Efficiency
- Extend Manufacturer's Warranty

Excellent protection for marine or other aggressive environments.

Silicon Chemistry Reaction Process

Figure 4. Hydrolysis of alkoxy silanes

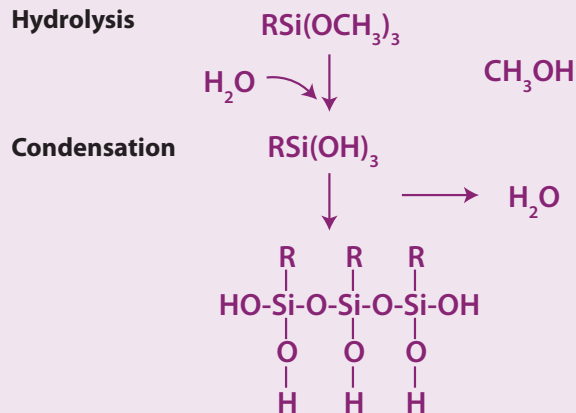
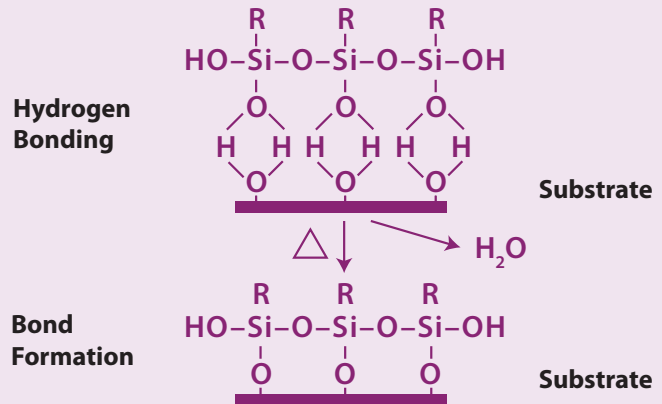


Figure 5. Bonding to an inorganic surface.



Silane and Cementitious Hydraulic Reactions share some significant analogies

Our protective coating is a reactive silanol specially formulated to react with and modify surfaces of noble metals such as stainless steel, aluminum, and copper-based alloys. The thin layer of clear polysiloxane stabilizes passive oxides that break down in marine and polluted industrial environments. On HVAC systems, operating efficiency is improved by 9-15% and heat exchanger life is extended by at least five years. It also mitigates clogging by mold, dust, and soot.

Power Consumption Comparison
New vs Units

Unit Size (tons)	New (clean) Coils Avg KWH/Day	285-day Old (dirty) Coils Avg KWH/Day	Performance Drop
3	27	38	-28.9%
5	37	54	-31.5%
7.5	49	75	-34.7%
10	82	112	-26.8%
15	107	163	-34.4%
20	139	216	-35.6%
25	180	272	-33.8%
30	205	326	-37.1%
40	277	443	-37.5%
50	347	549	-36.8%
60	420	657	-36.1%

Source: Data extrapolated from studies done by SDGE (San Diego Gas & Electric) based upon 285 days of usage.

Coating Characteristics

Competition's Organic Compounds

Form dense surface films but do not chemically bond with the substrate

Films are vapor barriers and impermeable (but often macroporous)

Our Silicon Compounds

Form chemical bonds and/or hydrogen bonds with substrate

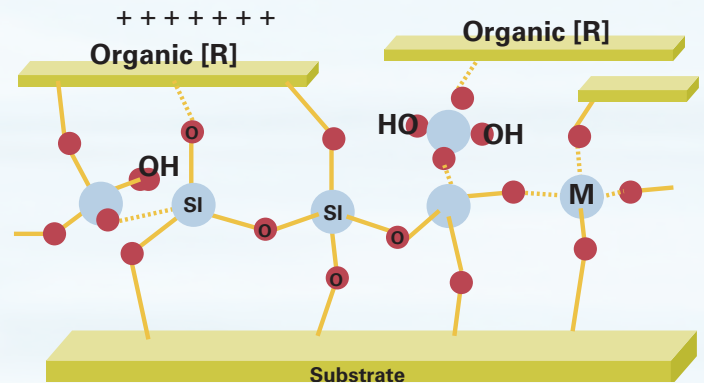
Coatings are vapor permeable but water resistant (microporous)

The level of permeability can be engineered, (i.e. zeolites and molecular sieves - nanotechnology)

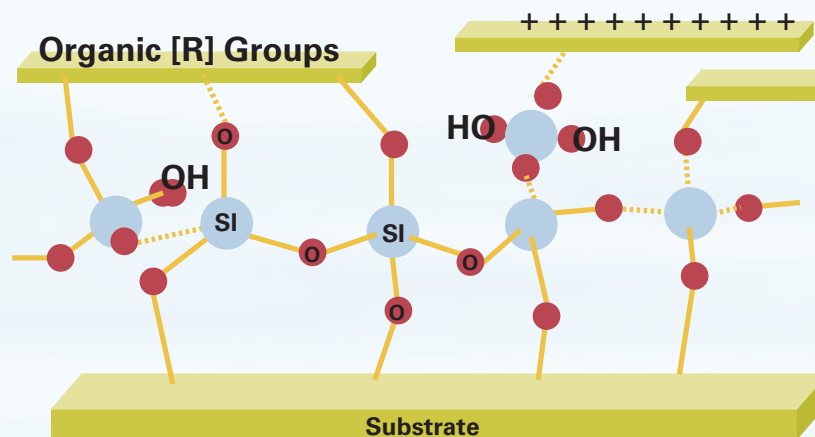
Polysiloxane Coatings for a Wide Range of Applications

The Technology: The RSS technology is based on clear polysiloxane films formed from SMT reactive silanol sols which can be applied to virtually any clean surface. This makes RSS a universal surface treatment without changing the color or character of the substrate. RSS can seal porous materials like weathered paint, masonry, grout, and tiles preventing bacteria or mold spores from being embedded or absorbed into the substrate. This feature facilitates easy cleaning and decontamination, while protecting the surface from damage by caustic, acidic, or chlorine bleach cleaners. The easy-clean surface reduces exposure of cleaning personnel to harsh chemicals and reduces cleaning time. This saves maintenance dollars and reduces exposure of facility operators to liability from nosocomial infections. Because micostatic/biostatic properties do not rely on biocides that degrade over time, the RSS-treated surface retains its full efficacy over time and is permanent unless mechanically abraded away.

How RSS Works: RSS efficacy is based on the unusual phenomenon of an electron- deficient surface formed because the silicon atoms in the silicon-oxygen interpenetrating network attract electrons away from surface carbon atoms. The net positively charged surface inhibits organic growth and viability without toxic and time-degraded biocidal additives. The siloxane film is also impermeable and provides no nutrients for microorganisms to feed upon.



Simplified Model of a Cured Siloxane Coating



- Covalently bonded with substrate;
- Condenses as amorphous siloxane
- R-groups orient to the surface: sets up positive surface potential
- Siloxane (Si-O-Si) bond 130% stronger than Organic (C-C) bonds

After "Silicone Resins Beyond The Millennium", PCI Magazine, 8/28/00. Used with permission.

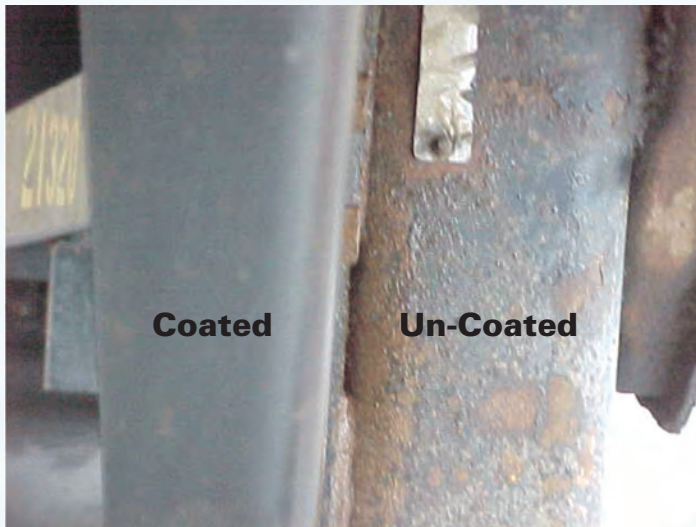
Attributes of Silicon-based Surface Modification Treatments

- Resistant to chemical attack
- Resistant to extreme heat
- Will not deteriorate with exposure to UV
- Clear and increase Depth of Image
- Resists abrasion - very hard
- Will not oxidize
- Non Combustible
- Properties can be engineered

Surface Tolerant Steel Coatings

Pro+Tec-WB is a water based, surface tolerant rust barrier coating or primer formulated to chemically bond with clean, dry metal surfaces. Unlike traditional organic coating systems, abrasive blasting or mechanical tool surface preparation is not required. It dries in minutes, not hours, and can be overcoated immediately with itself or paint. Unlike rust converters, Pro+Tec-WB leaves a thin (up to 2.5 mils per coat) polymer layer that protects the metal from further corrosion. Excellent CCG primer.

Pro+Tec-HT is a solvent-borne surface tolerant barrier coating rated to 700°F.



Truck Trailer with Landing Gear "Half Coated,- Half Un-Coated"

- Used on a 24 Hour a Day Route Between Toronto and Detroit
- Photographed at **500,000 Miles**



Truck Trailer with Frame Rail Coated, Bed Supports Un-Coated

- Used on a 24 Hour a Day Route Between Toronto and Detroit
- Photographed at **500,000 Miles**

Pro+Tec-WB vs. Paint

- | | |
|---|--|
| • Chemically bonds to metal | • Mechanical bond to solvent cleaned and roughened (preferably abrasive blasted) surface |
| • Minimal surface prep: remove grease, loose rust | |
| • Fast drying- can be overcoated immediately | • Up to 48 hour cure btwn coats |
| • Water based, low VOC | • Thick film, multiple coats |
| • Easy to spray; capable of brush | • High solids, low VOC |
| | • Harder to spray, hard to brush or repair |