

# Davlin™ Rewrites The Book On Marine Coatings — The Golden Gate Bridge

*The fog comes  
on little cat feet.*

*It sits looking  
over harbor and city  
on silent haunches  
and then moves on.*

*Carl Sandburg 1916*

When it comes to a coating protecting a bridge, there is perhaps no bridge in the world more demanding than the Golden Gate Bridge. Located at the headwaters of the Pacific Ocean, the Golden Gate Bridge joins two peninsulas — San Francisco to the south and Marin to the north.

Because of the notoriously poor weather conditions — salt-laden ice-cold wind, humidity and, of course, fog — the Golden Gate Bridge Authority has used for years a specification coating called VT 76. VT 76 calls for a solvent vinyl polymer manufactured by Union Carbide. The solvent portion is extremely volatile and very flammable. That was part of the bad news. The good news was that the coating dried almost immediately, and once dry, it exhibited good salt and water resistance.

Then, in 1987 the Golden Gate Bridge Authority received even more bad news. VT 76 contained far too much solvent. That is, it did not conform to the new strict VOC standards. A new coating would have to be found.

For 3 years the Bridge Authority looked in vain for such a product. The State of California has its own VOC compliant bridge specifications, commonly known as PWBs (paint water base) and PBs (high solids solvent base VOC compliant). These coatings work well on the State bridges. Fortunately, the bulk of these bridges, like the Oakland-SF Bay Bridge, are inland and subject to less rigorous environmental conditions. Unfortunately, these State of California coatings are not suited for the Golden Gate environment.

Davlin™ has been the major supplier over the years both to the Golden Gate Bridge Authority (the VT 76) and Caltrans (the State authority for bridge paint). In the spring of 1989, Mike Lindsey, the paint superintendent for the Golden Gate Bridge, called me regarding a technical question on another paint which we supply to them. The subject came up regarding the topcoat (VT 76) for the bridge. Mike told me of his lack of success in obtaining a suitable replacement. I asked him if Davlin™ could submit a product of its own for evaluation. He was agreeable to this and stated that he was evaluating a host of other commercial products.

Davlin is also a major supplier of marine enamels to the U.S. Navy (remember the Battleship Grey? It is now called Haze Grey). One of the projects under way for the Navy was the replacement of this Haze Grey silicone alkyd enamel with a VOC compliant water base enamel. So at the time of Mr. Lindsey's call Davlin™ was already evaluating different latex polymers as suitable candidates for marine use.

The bridge requirements, however, were far more demanding than this new Naval specification. This is what such a bridge enamel had to do:

1. It had to meet the current VOC standards of 340 grams per liter, maximum. This requirement alone virtually reduced

the possible candidates to high-solids, solvent-base coatings or latex enamels.

2. The coating had to dry fast and be resistant to water in a very short period of time. (Remember, the fog rolls in almost daily at short notice). This requirement further limited the possible candidates to high solids urethane systems or, if possible, a latex enamel.

3. The coating had to maintain excellent adhesion both to the old solvent-base VT 76 vinyl topcoat as well as the zinc rich primer.

As you can see by the above, the task was formidable. Latex enamels are not known to dry quickly. They contain water. And if one were to develop a latex enamel which dries rapidly, whoever heard of such an enamel which obtained "instant" resistance to water? The polymer in a latex system coalesces upon drying, a process which takes weeks to complete. Furthermore, latex enamels are not known to adhere well to solvent base coatings. The rule of the thumb is that when switching from a solvent base system to a water base one, you must first prime the old solvent base system before applying a latex coating.

All summer long Davlin™ was busy making batches of latex enamels, applying these enamels to metal panels coated and aged with VT 76, checking for dry time. Once dry, the panels were soaked in water for 24 hours and then checked for adhesion. Finally, during the late part of the summer of 1989 we hit the jackpot. The enamel dried quickly, was water resistant, and adhered well to the VT 76 as well as the zinc-rich primer.

Then came the long-term tests. Would the enamel hold up for years? Would it withstand salt and heat, water and UV exposure? The panels were placed in a salt fog chamber. Others were placed in an accelerated weatherometer. The answer was yes. In early November, 1989 we prepared 5 gallons of our new Sunshield product and sent it to the Golden Gate Bridge. Mike Lindsey then sprayed this sample on one of the toughest portions of the bridge—near the toll plaza on the underside. And we all played the waiting game.

The good news came in the early spring of 1990. I was invited by Mr. Lindsay to see for myself how this new Sunshield enamel was performing. As we walked under the bridge, I could see a recently-applied coating peeling off in sheets. My heart sank. "That's not yours," he stated. It was someone else's acrylic. Next, we inspected an expensive 3-coat, two-component urethane system. This too was failing. I was surrounded by failures. Then we walked a little further on and ahead I could see what looked like a freshly applied coating. It still had its shine, and there were no telltale signs of failure. "That's yours," he stated. My heart leaped. Although it had been already a half year old, our Sunshield latex enamel looked as fresh as the day it was applied. The adhesion was excellent.

This truly marks the beginning of a new era, hardly a decade ago, latex systems were known for their poor resistance to salt and water. Today, Sunshield 6000 is living proof that latex coatings will be the coatings of the future. Sunshield 6000 is not merely a good replacement for the old solvent-base VT 76 system. It is a superior replacement. Already, Davlin™ has developed coatings based on this technology for use as heavy-duty metal primers, marine and industrial enamels, concrete coatings and sealers as well as low temperature baked finishes.