KENALL® THE COMPETITIVE +EDGE

Issue #7 *The EnviroPro™ IN9 Series*

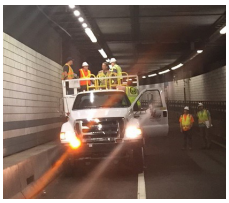
Galvanic Corrosion: What It Is, Why It Happens & How Kenall Rises to the Challenge

Galvanic Corrosion Defined

Galvanic corrosion is defined in multiple ways by different professions, but the simplest definition is the corrosion caused by contact between two dissimilar metals, in the presence of an electroyte, such as salt water. And while the problem can be localized, it can also be quite extensive, creating huge problems. Two notorious instances of galvanic corrosion were found at the Statue of Liberty in 1982, and the "Big Dig" in Boston, Massachusetts in 2011.

The Big "Oops" – Famous Galvanic Corrosion Failures

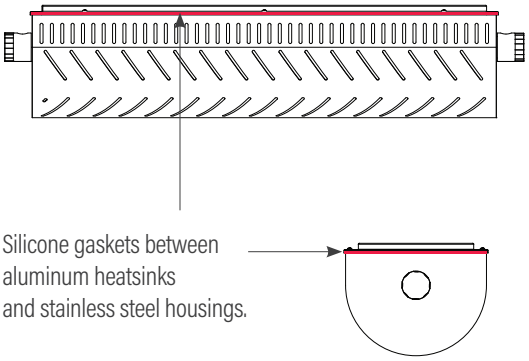
In the case of the Statue of Liberty, Gustave Eiffel anticipated galvanic corrosion and installed insulation between the copper skin and wrought-iron support structure. However, the shellac and asbestos strips wore away, leading to direct contact between the two metals, essentially turning Lady Liberty into a "giant battery"[1] Over the years, the advancing corrosion was hidden by layers of paint, until the extent of the damage was discovered and repaired in the 1980s.



In 2011, the Central Artery/ Tunnel (CA/T) Project in Boston – better known as the "Big Dig" – became the ugly center of controversy[2] when a 120 lb. light fixture fell into the middle of the road. Upon closer inspection, it was discovered that the five-year-old lights had coated aluminum brackets affixed with stainless steel light clips. Due to large amounts of saltwater seeping into the tunnel, the lighting mounts were subject to galvanic corrosion: consequently, $54 million worth of tunnel lights had to be replaced before they fell on the cars below them.

How Kenall Prevents Galvanic Corrosion, Even in Tunnels

Kenall has been manufacturing tunnel lighting for decades and our engineers are keenly aware of the hazards of galvanic corrosion. Kenall uses consistent materials where there is metal-to-metal contact, and we electrically insulates between materials that differ. For example, Kenall's fixture design places silicone gaskets between aluminum heatsinks and stainless steel housings.



Preventing Other Types of Corrosion

While some of Kenall's tunnel lighting is now available in aluminum, the majority is produced in either 304 or 316 stainless steel. Both are corrosion-resistant due to the chemical makeup of the stainless steel: 304 contains iron, nickel and chromium, plus smaller amounts of carbon, manganese, molybdenum and silicon. The 316 stainless steel shares the same chemical composition, with slightly different percentages, including more molybdenum.

For less harsh environments, specifiers can realize a savings by choosing 304 stainless. But for highly corrosive conditions, such as those found in tunnels, underpasses, and coastal settings, 316 stainless steel is recommended. Despite a higher initial investment, 316 stainless steel fixtures can actually have a lower total cost of ownership, due to the superior durability of the material.

Natatorium Lighting – and Kenall's Best Warranty Ever

For natatoriums, Kenall's EnviroPro IN9 luminaire design takes the protection of 316 stainless steel even further. The entire luminaire, including the pendants, wall-mount brackets, hubs and hardware are all manufactured with consistent materials to prevent galvanic corrosion in this hot, humid, caustic environment. The luminaire is IP65 rated to protect against the ingress of moisture and contaminants, shielding internal components from damage. ***The extra care with which this series is designed allows Kenall to offer the first 15-year mechanical warranty within the industry on luminaires specified with 316 stainless steel.***

If corrosion keeps you up at night, count on Kenall to rest easy. Second to none in the industry, you can specify Kenall luminaires with complete confidence.

[1] *We Accidentally Turned The Entire Statue Of Liberty Into A Battery (gizmodo.com)*

[2] *Between the lines of the Big Dig lights saga (boston.com)*