What is The Difference Between Tarnish and Corrosion?

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The word tarnish is sometimes used when attempting to minimize the damage to electrical, mechanical, and personal items rather than the correct term “Corrosion”. BEC considers this absolutely reprehensible, particularly with respect to the damage to construction materials.

Tarnish is a surface phenomenon which is self-limiting, unlike the corrosion in a home with CDW. In “tarnish”, only the top few layers of the metal react; the layer of tarnish seals and protects the underlying layers to keep them from reacting further.

Corrosion is a state of deterioration in metals caused by oxidation or chemical reaction. Corrosion in CDW environments is the chemical reaction between a material and its environment producing a deterioration of the material and its properties. Independent defense and plaintiffs experts have studied the surface of the metals and found pitting and crevice “corrosion”. In the field, metals have been affected to failure at bends in copper wire and pin-hole failures in copper pipe. Failures are well documented in air handler unit (AHU) coils. The AHU coils pit through the tubing, releasing the refrigerant gas to the occupied space.

The electrical wiring pits in the same manner except there is no gas to release. The pits on the wiring cannot be cleaned out, the deposit remains in the pit, even if the wire’s surface is attempted to be cleaned. This deposit is a different material than the underlying metal. To indicate corrosion does not continue once the source material is removed is incorrect. In fact, in oxidation corrosion, the material is considered a metal salt with different properties than the base metal and the corrosion has hygroscopic properties, meaning it can draw its moisture for a reaction from elevated humidity in the air.

Phenomenons in corrosion such as under-deposit corrosion, geometric pitting corrosion and galvanic corrosion from dissimilar materials are a few of the ways the corrosion can continue as an oxidation process. Long term studies have not been done to see the full extent of the problem over time.
BEC cannot imagine telling a client “your air conditioning coil “tarnished” to the point of failure”. Corrosion Engineering defines corrosion as “the chemical or electrochemical reaction a material, usually a metal and its environment, which produces a deterioration of the material and its properties”. Documents within the National Association of Corrosion Engineers use the word tarnish as a protective coating; CDW does not place a “protective” coating on silver and copper, the effect is destructive; therefore corrosion is the correct term.

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