

Zinc Whiskers

Zinc whiskers are small crystals of zinc that grow naturally from zinc-plated surfaces. They were first discovered in 1948 by Bell Labs. Zinc whiskers are most commonly found growing on the underside of wood-core raised access floor panels that have a flat steel bottom. Zinc whiskers have been found to cause equipment failures ranging from minor data corruption or anomalies to catastrophic hardware failures.

Wood-core floor panels

Wood-core raised access floor panels with a flat, steel sheet as the underside have been found to be the most common breeding ground of zinc whiskers. These panels consist of a premium-grade, high-density, resin-bonded particle board that is one inch thick and completely encased by a galvanized steel top sheet and bottom pan. The top steel piece of the floor panel is covered with a high pressure laminate (HPL). The underside steel piece of the floor panel is coated with zinc because it is a mineral that prevents rusting and oxidation. The coating process is either hot dipped galvanized (HDG) or electroplated. Only those panels that are coated by an electroplated process are capable of growing zinc whiskers.

In the past, zinc electroplated wood-core floor panels were manufactured by several companies and were extremely popular because of their economical benefits. Today, most of the manufacturers have stopped producing this type of floor panel. Unfortunately, enough time has passed that systems that were installed years ago are now experiencing zinc whisker complications.

The truth about zinc whiskers

Zinc whiskers are capable of growing 250 microns per year. They seem to have a uniform diameter of 2 microns. They are harmless if they remain attached to the floor panel. If disturbed, a zinc whisker will break free and become airborne. It will then circulate through the mission critical facility and may eventually rest inside a sensitive piece of equipment. Because zinc is a conductor of electricity, it can cause equipment failures or system resets if it rests on an exposed circuit card.

Zinc whiskers are extremely stubborn. They will grow in any environmental condition (even a vacuum). And they are so minuscule that normal dust filters that are used in mission critical facilities are ineffective.

Discovering zinc whiskers

Determining if your mission critical facility has zinc whiskers is a difficult and extremely risky task. Zinc whiskers are virtually invisible to the naked eye. To spot them, panels must be removed and observed in specific settings. But, removing floor panels can disrupt the zinc whiskers and create a

more severe problem. For these reasons, Bick Group recommends that an expert in identification, containment, and clean up of zinc whiskers be brought in. But, before calling an expert, here are a few symptoms that are common to facilities with a zinc whisker problem:

- » Unexplained hardware failures (particularly disk drives and power supplies)
- » Unexplained data corruption problems
- » Problems occurring more frequently or more severely after equipment has been moved or work has been done underneath the raised access floor system.

Although zinc whiskers pose a serious issue, the contamination is certainly manageable without causing interruption to the operation of the mission critical facility. If you are experiencing symptoms of zinc whiskers, give us call to discuss containment practices.

Bick Group has subject matter experts in this and many other topics. Talk to our Access Floor experts by emailing: rmahoney@bickgroup.com