

Sales Engineering

Technical Paper Series

Zinc Whiskers

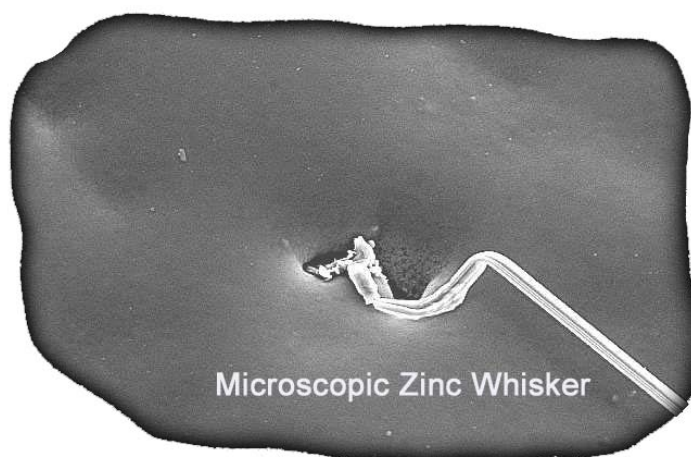
What are they and how do we deal with them?

Quite simply put they are small microscopic “whiskers” that originate from zinc-electroplated products. These zinc-plated products are commonly found in computer rooms, and specifically in the under-floor environment.

Examples would be computer floor tiles, floor stanchions, cable runways, or wire-basket cable trays.

Bell Laboratories first discovered zinc Whiskers in the late 1940’s on zinc plated wall brackets. These brackets supported quartz filters used in telephone transmission system. The zinc whiskers caused losses on these filters and problems with telephone transmissions.

The telecommunications/high tech industry is experiencing resurgence in zinc whisker failures. This is due to the microelectronics that are commonly found in today’s data-centers and sophisticated electronics. These tiny whiskers create havoc when they find their way into these microelectronics. The problems they create are micro-sized short circuits, voltage variances, or system resets. Effectively creating chaos in expensive and critical electronic equipment or creating un-scheduled down time. The other problem is because of their size the short circuit process often vaporizes them, and essentially leaves no evidence behind except for equipment resets or failure.



Microscopic Zinc Whisker

The under-floor computer environment is a prime atmosphere for growing these zinc whiskers. Whiskers grow from zinc-electroplated products, much like stalactites found in caves. The humid controlled environment offers the perfect conditions for these whiskers to grow. The under-floor environment is also where you will find support stanchions for the computer floor, wire-basket type cable trays, and cable runways. Electro-zinc plated

finish is a common finish on all these products, and therefore large sources of material to grow these whiskers.

Routine maintenance activities in a data center can cause these whiskers to dislodge from the surfaces they are growing on and be released into the room air. Room air-conditioning can

distribute these whiskers to sensitive electronics, and well as mentioned in an earlier paragraph create all sorts of problems.

The best way to counteract zinc whiskers is to minimize materials that can act as a host for them to grow. Offering products that are powder-coated or manufactured from another material is the best starting point. In the case of wire-basket, stainless steel is another option. You must understand that there will still be zinc electro-plated products in computer room environments including under floor. It’s just a more economical solution than plating with gold, which if you can sell it would be the best plating material to use! If the area contains sensitive electronics and zinc whiskers on cabinets, racks, strut, framing, or wire management are of concern, alternatives finishes or materials such as powder coating, or stainless steel are the answer.