

Case Study: The Strong Cap and Invisible Fence®

In 1999, Al Meyers began working for Invisible Fence, the leader in electronic dog fence systems, as a lead technician. Over the next three years, Meyers grew his career within the company, but realized he wanted more. He was passionate about his work and loved the company, so he decided to invest in his future and his career. In 2002, Meyers became the owner of Invisible Fence of the Heartland and in the 10 years that followed he would grow the company to help more than 5,500 customers across Nebraska and Iowa provide a safe, outdoor environment for their pets.

How the System Works

The electronic fence designed by Invisible Fence uses digital radio frequencies, controlled by a centralized control panel, to broadcast a signal along an insulated cable that's buried in the ground. This signal creates a protective boundary that is detected by a receiver in a custom pet collar.

If the pet crosses the boundary while wearing the collar, the collar releases an audible tone followed by a gentle static correction. Over time, and with proper training, the pet learns the boundaries of the property, understanding where they can and cannot go.

Special Grounding System

On average, Invisible Fence of the Heartland installs 350 electronic fence systems per year. Of those 350 installations, there are typically about 100 that require a special grounding system. A special grounding system can be required for multiple reasons such as a lake-front home that only requires a three-sided boundary.

"Because of the nature of the special grounding system needed, it wasn't a matter of if the electronic fence would stop working, it was a matter of when," said Meyers.

When the system would fail, Invisible Fence of the Heartland fixed the grounding issue at no cost to the customer. Each time the system failed it cost nearly \$200 per fix, which is approximately \$20,000 per year. And that was to fix only the new fails so it became a never-ending chain of installing and fixing the grounding systems.

The Underlying Problem

Even though Invisible Fence was able to fix the failed system, the fix did not address the underlying problem. Why was the grounding connection failing?

Over time, ground rod connections can become inadequate and cause the power quality to become too low to function properly.

"We would find that there were two main causes for the ground rod connections for the Invisible Fence system to fail—corrosion (soil or galvanic) or thermal stress," explained Meyers.

[Soil corrosion](#) occurs when the chemicals within the soil interact with the ground rod metal, causing it to breakdown. [Galvanic corrosion](#) occurs when two dissimilar metals are in contact with each other and come in contact with water, causing both to breakdown. Galvanic corrosion is one of the most common types and typically the most destructive. [Thermal stress](#) is caused when the ground rod is subjected to changes in temperature. In the Midwest, temperatures can range from negative 30 to more than 100 degrees over the course of the year.

Because a ground rod connection is electrified, when it becomes corroded it can lead to a potentially unsafe situation. Both Occupational Safety and Health Administration (OSHA) and the U.S. Department of Health and Human Services

The Strong Cap-Invisible Fence Case Study

(HHS) have conducted studies on electrocutions in the work place with similar findings: on average electrocutions account for seven percent of all fatalities, approximately 411 fatalities per year. The leading cause for electrocution is improper or faulty grounding.

Finding a Better Solution

Prior to 2012, there was nothing on the market that could solve the ground rod connection problem. The [National Association of Corrosion Engineers](#) (NACE) is an organization whose mission is to “equip society to protect people, assets and the environment from the adverse effects of corrosion.” They help to set industry standards and have conducted studies to better understand the chemical reactions to items to increase the lifespan of products.

“I knew there had to be a better solution — something to solve the problem not just fix it. I did tons of research, but couldn't find anything that worked. So, I decided if I couldn't buy it, maybe I could make it. I started to test different applications in the field and failed miserably. A lot. But I kept trying and eventually found a solution that worked,” said Meyers.

Strong Cap LLC.

In 2012, Strong Cap LLC was formed. The solution Meyers developed was a three-in-one product that

provides long-term protection against corrosion and help protect ground rod connections.

Named the Strong Cap, the kit is made up of three parts: a clamp, a stabilizing SC-6 silicone and a cap. Because all the components are non-conductive, the solution does not change the function of a proper ground. Once installed, the Strong Cap provides maintenance-free corrosion protection. It's UV resistant, can be buried below ground level, submerged in water and can accommodate different ground rod sizes.

Installation of the Strong Cap takes approximately five minutes. That's nearly a 96 percent savings compared to almost two hours Invisible Fence spent diagnosing and repairing the failed system. With a retail cost of \$34.95 per kit, Invisible Fence has saved nearly 83 percent in ground rod connection repair costs. Since the solution was developed, Invisible Fence has installed near 2,000 Strong Cap systems across the U.S. and has a zero percent failure rate.

The Strong Cap solution is more than saving time and money. It's about protection.



Founded in 2012, Strong Cap LLC is the maker of the Strong Cap, a three-in-one product designed to provide long-term protection of ground rod connections. Strong Cap protects against exothermic weld failures, stray voltage issues, corrosion and disconnection. Strong Cap is based in Omaha, Nebraska.
