

MK Battery's Life-Cycle Series

Part 1: Battery Life and Environmental Risk



Engineering Reliable Power

It's Super Bowl Sunday. Millions of people are watching the game. Suddenly, one of your power supplies fails. No problem, you've got battery backup. But the batteries you replaced only a year ago don't kick in. Your customers' TV screens go dark, and complaints flood your call center. Can this happen to you?

Fortunately, MK Battery can protect you from such a customer relations nightmare. The company's sealed gel and sealed absorbed glass mat (AGM) batteries feature state-of-the-art manufacturing processes to ensure that your batteries won't fail early and leave you unprepared. In fact, it backs its batteries with warranties of up to five years.



All batteries are subject to more than 200 quality control checks.

Reducing Maintenance Costs

Batteries fail prematurely for several reasons. The most common is a lack of maintenance. To guarantee performance, wet cell batteries must be refilled as often as four times a year. It can take a technician 45 minutes to climb

the pole, remove the battery string from the power supply, pull the caps, refill each cell, replace the batteries, and secure all the connections. You've got your hands full upgrading the network, and probably don't have technicians dedicated to servicing your batteries.

MK Battery solves your maintenance problem. Because its products are sealed, they never need refilling. Gasses recombine to create new water. The only maintenance required is a 10-minute check of connections to make sure the battery string is receiving the proper charge. This can be done twice a year during your power supply checks. Your batteries won't dry out and fail prematurely.

Quality Construction Improves Life

Shoddy construction and poor components also cause premature failure. MK Battery is the only domestic manufacturer that uses tank formation to activate its battery plates. Although a more expensive process, by activating all plates at once, at lower temperatures and lower specific gravity, MK Battery provides greater plate-to-plate consistency than its competitors. The result is excellent cell-to-cell balance, which is critical for batteries deployed in a string. If cell capacities differ, you overcharge some cells and undercharge others, which degrades the battery and causes it to fail.

MK Battery also uses a multistage filling/vacuuming procedure to fill its cells with gelled thixotropic electrolyte. Most other manufacturers fill their gel cells in one process, vibrating the battery to release trapped air. Unfortunately this process can leave air pockets along the gel-to-plate interface. This interface is absolutely critical, as any air pockets along the plate result in non-reactive voids, which lower battery capacity. What's more, these dry spots become over charged and can migrate to other parts of the battery, causing it to fail.

MK Battery fills and vacuums each cell several times, which completely removes unwanted air. In addition, the company weighs each battery before and after filling, to guarantee proper gel levels. MK Battery also rigorously monitors the temperature of the electrolyte, refrigerating it prior to filling thus preventing any degradation and again extending battery life.

Once in place, it's essential that the electrolyte gel stay in place. MK Battery wraps the edge of each plate in its gel batteries with a special material. This edge wrap prevents the internal migration of active material, which leads to premature battery failure from internal shorting.

The batteries also feature weld gaskets that are located between each battery cell. One of the causes of self-discharge in batteries is the minute electrical currents that flow between each cell through the partition at the weld area. By using a weld gasket, MK Battery blocks these currents and reduces self-discharge to less than 3 percent per month, as much as a seven-fold improvement over competitors.

By using top-quality components and manufacturing processes, MK Battery saves you time and money. Because its batteries won't fail prematurely, you won't waste valuable labor and capital resources replacing them early. Customers benefit too. You won't have disgruntled subscribers besieging your call center because your backup power fails to engage.



MK Battery delivers your new batteries and takes your spent ones for proper disposal.

Minimize Your Environmental Risk

Competition is cut-throat in your market. Because your network carries video, data and voice services, you can't afford even the shortest outage. You're prepared. You've added battery backup to all of your power supplies.

But, the pile of spent batteries in the truck yard keeps growing. You'll tackle that problem tomorrow. Unfortunately, one of your technicians backs his truck into the pile, and cracks the cases on several batteries. Sulfuric acid leaks out, corroding everything in its path. Now you're faced with an environmental hazard, employee safety risk and costly cleanup. How could you have prevented this?

Batteries contain many elements that can be harmful to both the environment and employees. As batteries proliferate in the cable television network, multiple system operators (MSOs) must take measures so see that these devices are properly stored, used and disposed of. Failure to do so can result in injury, fines and even criminal penalties. MK Battery offers products that greatly minimize the environmental risks posed by batteries. What's more, the company's recycling services virtually eliminate an MSO's liability for spent batteries.

Proper Storage and Disposal Guaranteed

Because MK Battery maintains a distribution network of more than 50 sites, it can ship a new battery to you within 24 hours. Thus, your need to store large quantities of fresh batteries is eliminated.

MK Battery also regularly collects your spent batteries at no charge and disposes of them at an EPA-certified recycling facility. The environmentally harmful elements—40 pounds of lead, two pounds of plastic and more than a gallon of sulfuric acid—are 100 percent recycled.

What's more, MK Battery provides you with documentation to protect your system from potential liability. The company assigns a part number to spent batteries and main-

tains a record of all batteries received and date delivered to an EPA-certified smelter. It provides this documentation to the local MSO office, the corporate headquarters, and it maintains copies in its archives. Without such documentation, cable operators face cradle-to-grave liability should their batteries cause environmental damage.

Minimizing Field Risk

Batteries deployed in the field also pose environmental risk. Fortunately, MK Battery's innovative manufacturing processes significantly reduce the potential for environmental harm.

Because MK Battery uses a thixotropic gelled electrolyte, the battery is spill proof. Even if smashed open, sulfuric acid can't leak from the battery. You won't need to call an OSHA cleanup crew if an accident occurs.

What's more, the batteries feature a sealing valve that keeps the cell pressurized and safely releases excess hydrogen and oxygen gases created from overcharging. Because a battery can explode if gases aren't vented properly, MK Battery tests all of its sealing valves twice—after manufacturing and after installation—to ensure both proper seal and release.

The company is religious in its quest for a leak-proof battery. It also uses forged terminal posts and bushings, which are completely solid with no porosity. The result: longer life and no leakage of corrosive gas, which could damage sensitive electronic equipment.

All batteries also undergo a pressure test as well as a water bath to ensure they are leaking neither cell to cell nor outside the container. In fact, MK Battery undertakes 250 quality control checks to ensure it delivers a safe and reliable product.

You've got your hands full building a robust broadband network. MK Battery can lighten your load by providing a battery that won't leak and properly disposing of spent batteries. With MK Battery as your partner, you protect your network, your employees and the environment at



EPA-certified recycling facilities are utilized to protect you from risks.



Hazardous elements generated by spent batteries are 100% recycled.