ZOMEWORKS CORPORATION

Passive Energy Products

COOL CELL® Temperature Regulating Enclosure

● Increases System Reliability ● Lowers Maintenance Costs ● Extends Battery Life
● Uses No Electricity ● Convective Hydrogen Vent Simply and Safely Dissipates Hydrogen

Your batteries are backing up your system, but what is backing up your batteries?

Applications

● Telecommunications ● Electric Utilities ● Oil and Gas
● Data Acquisition & Transmission ● Street / Traffic Lighting ● Railroad
● Remote Monitoring Equipment ● Cathodic Protection

Cool Cells are highly insulated, passively cooled enclosures designed to protect batteries and sensitive electronic equipment from temperature extremes and exposure to the elements. No electricity or scheduled maintenance is required and there are no moving parts, which guarantees reliability. Durable, steel construction and long service life have made them an industry favorite.

Two medium-sized Cool Cells are used to provide power for environmental monitoring equipment. Mono Lake, CA

Operation

Cool Cells work by absorbing excess heat inside the enclosure during the day and radiating heat out at night. Water tanks inside the Cool Cell absorb both ambient heat (from outside) and heat from batteries and electronics. These tanks are connected to the water-filled plenum (lid) of the Cool Cell, which acts as a radiator. During the hot part of the day, water moderates temperatures by absorbing heat in the enclosure. In the evening, as ambient temperatures fall, the water circulates through the lid and excess heat is radiated to the night sky, replenishing the tanks with cool water for the next day.

Convective (H_2) Hydrogen Vent

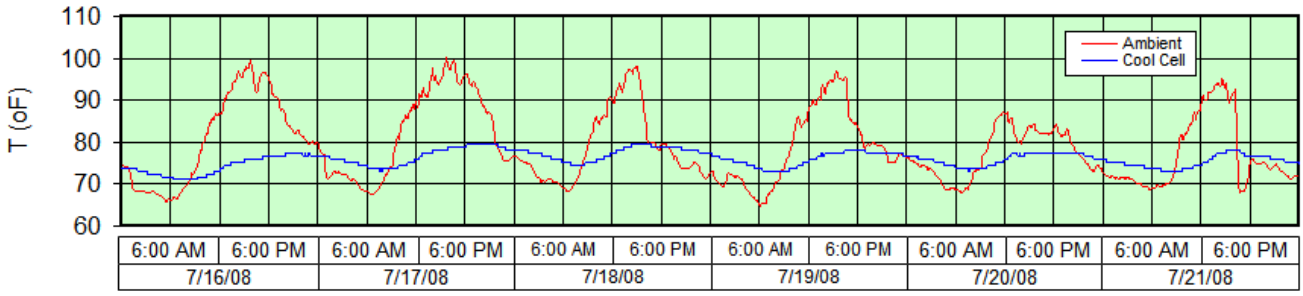
All Cool Cell battery enclosures are fitted with the Convective H_2Vent to expel hydrogen gas generated by the batteries while minimizing an exchange of air that might induce unwanted overheating or cooling inside the enclosure. Passive operation of the H_2Vent assures reliability. The Zomeworks H_2 Vent promotes airflow and exhaust **only** when hydrogen is present and stifles thermal convection. For more information, visit www.zomeworks.com. (Click on H_2 Vent in bright blue side bar on right.)

Cost Effective

Although initial costs are greater than other battery enclosures, Cool Cells are a wise choice for protecting batteries and electronic equipment. Midnight service calls, system downtime, costly maintenance, and frequent battery replacement become things of the past with a Cool Cell enclosure protecting your batteries. These combined savings result in a quick return on investment. When used to protect batteries in hot climates, the ROI can often be 4 years or less. Many Cool Cells have been in the field for over 20 years and have dramatically extended the service life and reliability of batteries and electrical components.

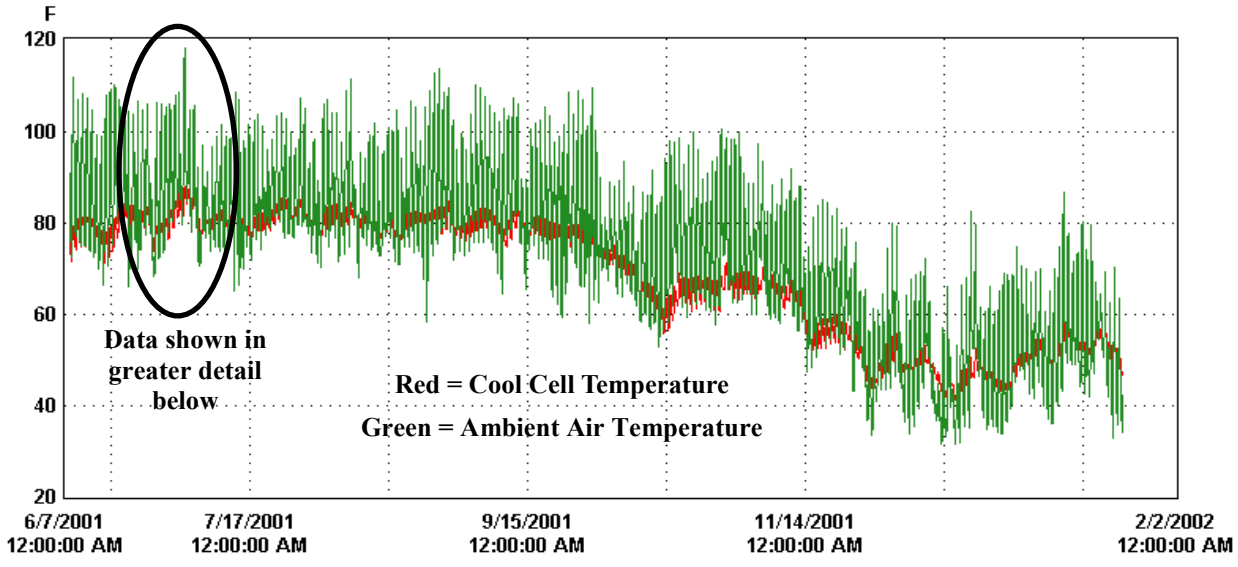
Performance

Cool Cells perform best in hot, dry climates but work well even in tropical Florida. As a rule of thumb, the average temperature of a Cool Cell containing batteries will be close to the lower ¼ point of the daily high and low. If the high is 90°F and the overnight low is 70°F, the Cool Cell will average 75°. Cool Cells also guard against sub-freezing temperatures in winter. As internal temperatures approach 39°F, water in the cooling system becomes more dense, which stops convection and further cooling. As water in the reservoir freezes, the heat of fusion adds warmth to the enclosure. Cool Cells will maintain temperatures close to 32°F until all the water is frozen. In colder climates, where prolonged exposure to freezing temperatures are expected, heaters can be installed.



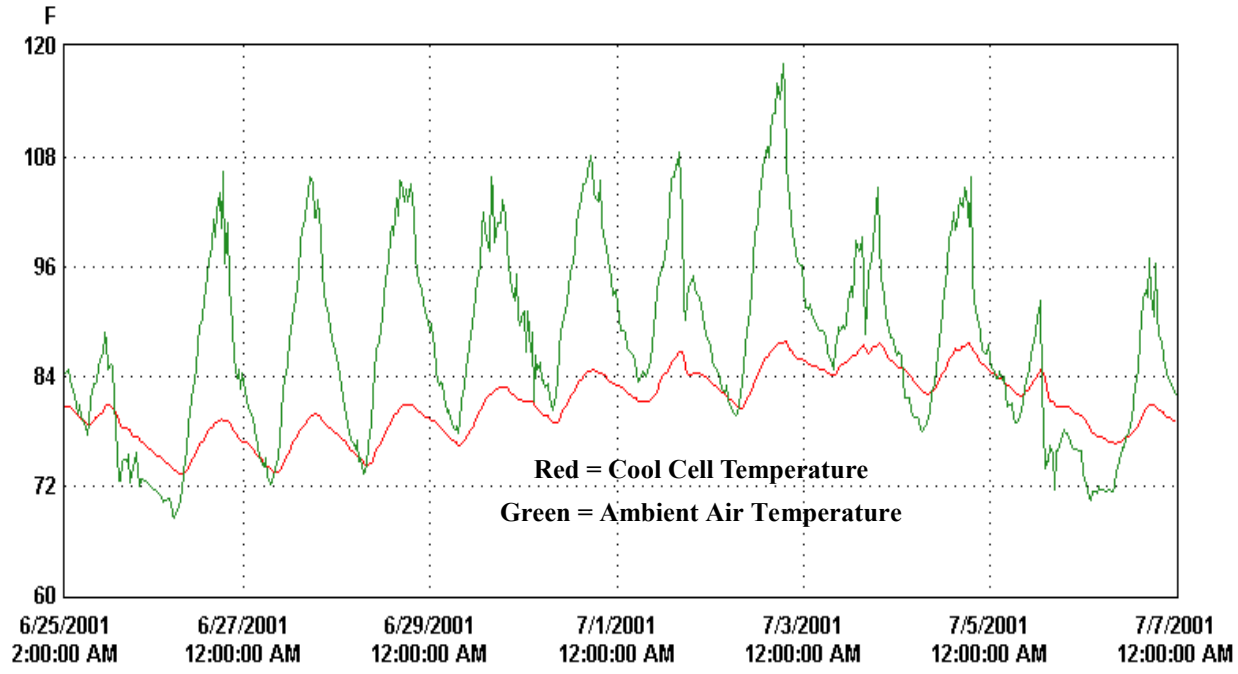
This data was collected from ongoing testing and monitoring of the Cool Cell Tank-Top Watt Box on a solar powered light pole in the Zomeworks yard in Albuquerque, NM.

Independent Cool Cell™ Results: Tucson, Arizona



30 days/div 240 days (M/d/yyyy h:mm:ss tt) Graph file: C:\SPECTRUM\Cray0102.spg

LN	Serial #	CH	Units	Description	Logger file	Logger description
1	10051096	1	F		C:\SPECTRUM\CC0102.SPL	Craycroft Coolcell
2	10051096	2	F		C:\SPECTRUM\CC0102.SPL	Craycroft Coolcell



2 days/div 11 days 22:00:00 (M/d/yyyy h:mm:ss tt) Graph file: C:\SPECTRUM\Cray0102.spg

LN	Serial #	CH	Units	Description	Logger file	Logger description
1	10051096	1	F		C:\SPECTRUM\CC0102.SPL	Craycroft Coolcell
2	10051096	2	F		C:\SPECTRUM\CC0102.SPL	Craycroft Coolcell

As predicted, the Cool Cell™ is riding the lower 1/4 point of the daily ambient high and low temperature. These excellent performance results were achieved at an actual switch site in the Tucson area where daytime temperatures often reach 110°F.

TOP LEFT: *Telecom, Yuma, AZ.* TOP RIGHT: *Backup power for switching station, Albuquerque, NM.*. LOWER LEFT: *SCADA monitoring system on gas pipeline, Otowi, NM.* LOWER RIGHT: *3-48V String, Cellular Site, Charlotte, NC.*

RIGHT: *Telecom Site. Batteries were moved from an underground vault to a Cool Cell for easier maintenance and access. Tucson, AZ*

Cool Cells are adaptable to customer's specific needs and can include: sliding drawers, charger side boxes, wiring harnesses, etc.

Oil & Gas Industry. Remote monitoring system, PV rack, battery storage, and equipment box were integrated into skid. Designed to withstand 90 mph wind gusts as free standing structure. Eagle Ford, TX

Large Cool Cell battery banks with integrated PV system. Monitoring Demonstration Project. Arizona Border

Locating the batteries outside creates more space inside and improves battery access. Zuzax substation, Zuzax, NM.