PRODUCT DATA SHEET

Copper-Copper / Sulfate Reference Electrodes

Tinker & Rasor made changes to the plastic body of the Models 3-A, 6-A, 6-B, 8-A and 8-B half cells. This change came about through our efforts of continual improvements on our products.

The previous material used for the body of the reference electrodes was an extruded acrylic material. This material had been in use for the half cell bodies for many, many years, but it was not ideal for the application.

The extrusion process cannot make a true and perfect circle and this results in the extruded tube becoming oval in part or all of the length. The out of round shape results in issues with the thread cutting during the manufacturing process. When the threads are cut into the extruded acrylic, the threads can end up being very deep on one half of the tube, and quite shallow on another. This inconsistency leads to a high level of product failures in final testing. More importantly, if this issue is not caught, the reference electrode can leak. (And potentially destroy the carpet of a brand new F150, for instance)

The acrylic material is also not suitable for long term use outdoors. It has very poor UV resistance, and will deteriorate with long term exposure to sunlight. This can mean cracking of the material, especially at the ends where the threading has made the material thinner.

Finally, there is the issue with sunlight. The chemical reaction that takes place between the copper rod and copper sulfate crystals produces a known voltage, which is meant to be consistent and stable to be used as a reference voltage. Sunlight will affect this chemical reaction, and actually change the voltage produced. This can produce misleading results. Sunlight coming through the clear window can change a pipe to soil potential reading by 50mV or more.

Another common error created by environmental issues is temperature. We have more on that effect on a link on our website: http://tinker-rasor.com/temperature-html/

These issues led us to make a change in manufacturing method and materials for our reference electrodes. The result was to move to an injection molded thermo plastic material. Injection molding provides a highly consistent part, in both shape and thread consistency, meaning more perfect threads leading to a very tight seal on both ends of the half cell body. The plastic material is much stronger than acrylic, has no windows for sunlight to shine through and much better insulating properties that acrylic to keep the inside of the half cell at a more stable temperature. This is especially when stored in the cab of a truck as opposed to the open bed.

In the end, the Tinker & Rasor reference electrodes produced better results with much longer life than with the previous material versions. However, we did hear from many of our customers that they wanted the window back. They were aware of the potential issues with sunlight and temperature, but wanted the convenience of a clear window to easily see the condition of the liquid in the cell.

To that end, Tinker & Rasor offers the Clear View window, part number 162-012. This is an injection molded part, about an inch long, made of clear thermo plastic resin and can be screwed on to either end of the Models 6-A, 6-B, 8-A or 8-B reference electrode. If you would like to try this part to see if it works for your needs, please let us know and we will be happy to send you some. Info@tinker-rasor.com

Tel: (909) 890-0700 Fax: (909) 890-0736
P. O. BOX 1667 SAN BERNARDINO, CA 92402-1667
Web: www.tinker-rasor.com E-mail: Info@tinker-rasor.com