AUTOMATIC MACHINE FOR

LEAK TESTING ON SEALED BATTERIES

MARPOSS

Introduction

We are facing new challenges in leak testing as we strive to deliver high-performance, long-lasting, and safe lithium batteries. From a closer analysis of the lithium battery, we learned that humidity needs to be avoided at any cost. If humidity penetrates a battery it can cause:

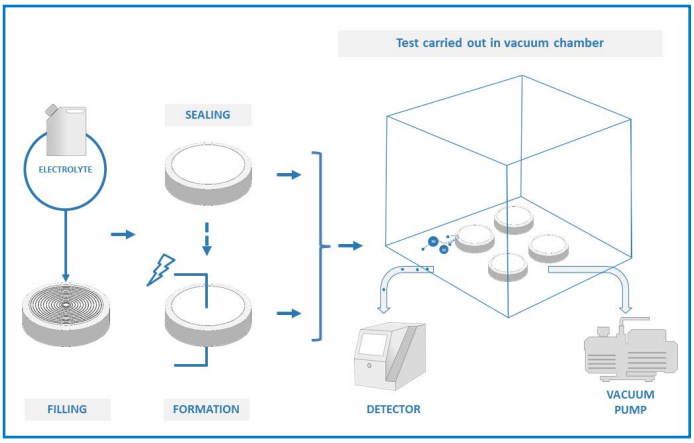
- Premature battery aging: the battery reduces its capacity.
- Longer battery recharge time to full capacity.
- Possibilities of battery fires and runaway.

The other potential problem is the hazard to the environment if the electrolyte is leaking from a battery. The salts dissolve in the electrolyte, then combine with water, and then create hydrogen fluoride (HF) which is considered Toxic at a very low concentration (1 ppm) or is considered corrosive at a higher concentration (above at 24 ppm).

Marposs Solution

To solve the above concerns, modern leak test equipment should meet a series of characteristics that will ensure state of art quality standards:

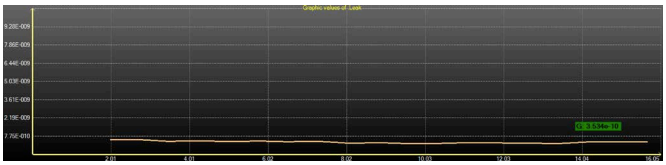
- High sensitivity to sort the good batteries form the leaking ones.
- Short cycle time in order to test up to one cell per second for the button cell batteries.
- Safety verification to avoid cross-contamination of the system in the case a battery cell with a gross leak arrives into the station.
- Automatic contamination detection.
- Automatic cleaning cycles to recover from contamination.
- Sorting devices in order to send the good batteries to the next process in the production line and to segregate the leaking batteries for further analysis.



The state of the art for the leak testing of the battery cells provides for the use of helium as tracer gas in the vacuum chamber. The test can be carried out before filling with electrolyte, when the cell is still open and there is therefore an access channel for the helium supply. By doing so, however, it is not possible to test the tightness of the final seal. Alternatively, it is sometimes possible to add helium during the electrolyte filling and trap the tracer gas inside the cell.

For all cases in which it is not possible or not allowed to add helium or another tracer gas inside the cell, Marposs has developed a system (Patent Pending) that can test the sealed batteries in mass production, to detect if the batteries are leaking. This system, based on the **tracing of the electrolyte** itself, is conceived to work in the automatic lines of a production plant, for different types of cells and different combinations of the active materials inside it, before or after formation. We have solved all the industrial challenges and have successfully addressed all the key points associated with leak testing lithium batteries.

Background noise



Signal from master leak 10*μ*