



**ZETATEK**<sup>®</sup>  
Committed to Excellence

**Simulating Environments  
Since 1990.**



## Battery Testing Chambers

### Introduction

Battery testing mainly involves the analysis during fast charging and discharging under simulated real world conditions or under extreme stress. These tests can be very dangerous and can cause the release of poisonous/explosive gases, spontaneous fires or even explosions.

Zetatek is proud to introduce its new range of Battery Testing Chambers which are equipped with a host of safety features which enable the users to perform various test with assured safety in the laboratory.

### Hazard Levels

Hazard Severity Level	Description	Classification Criteria and Effect
0	No Effect	No effect. No loss of functionality
1	Passive Protection Activated	No defect; no leakage; no venting, fire, or flame; no rupture; no explosion; no exothermic reaction or thermal runaway. Cell reversibly damaged. Repair of protection device needed.
2	Defect/Damage	No leakage; no venting, fire, or flame; no rupture; no explosion; no exothermic reaction or thermal runaway. Cell irreversibly damaged. Repair needed.
3	Minor Leakage	No venting, fire, or flame*; no rupture; no explosion. Weight loss <50% of electrolyte weight (electrolyte = solvent + salt).
4	Major Leakage	No fire or flame; no rupture; no explosion. Weight loss ≥50% of electrolyte weight (electrolyte= solvent + salt).
5	Fire or Flame	No rupture; no explosion (i.e., no flying parts)
6	Rupture	No explosion, but flying parts of the active mass
7	Explosion	Explosion (i.e., disintegration of the cell)

## Safety Features

- 1 Electronic Door Lock**  
Chamber door is locked using an Electro-Magnetic door lock. During testing, the chamber may contain hazardous gases released from the batteries and the lock prevents users from accidentally opening the door.
- 2 Status Indicator and Alarm**  
A visual status indicator can be used to monitor the chamber's status from a distance. A red lamp flashes during any faults in the system along with an audible sound which can quickly alert operators.
- 3 Retaining Clamp for Port Hole Plugs**  
Due to pressure differential that may arise between the chamber test space and the ambient atmosphere during testing, the port hole plugs are secured using a retaining clamp.
- 4 Temperature Limited Heaters**  
Heater surface temperatures are maintained below the auto ignition temperature of the combustible gases that may be released from the batteries, thereby preventing ignition.
- 5 Mechanical Door Latches**  
Chamber Door is secured with sturdy mechanical latches on both sides. Any increase in pressure inside the chamber is safely contained.
- 6 Gas Monitoring**  
Concentration levels of Carbon Monoxide (CO) and Hydrogen (H<sub>2</sub>) are monitored using a sampling system with electrochemical sensors.
- 7 Fire Detection and Alarm System**  
Fire detection is possible by monitoring the carbon monoxide levels or by a sudden increase in chamber temperature. Once fire is detected, an audio-visual alarm can be triggered for alerting the operator.
- 8 Fire Suppression/ Extinguishing**  
When a fire is detected inside the test space, it is extinguished by flooding the test space with carbon dioxide (CO<sub>2</sub>) or Nitrogen (N<sub>2</sub>).
- 9 Chamber Inertisation**  
After the completion of a test, the chamber may be inertised with nitrogen (N<sub>2</sub>) in order to flush out any hazardous or combustible gases and reduce the oxygen concentration before opening the door.
- 10 Oxygen Measurement**  
Oxygen measurement is used in conjunction with the chamber inertisation to monitor the concentrating levels and control the nitrogen flushing.
- 11 Pressure Relief Vent**  
A pressure relief vent is provided to equalize the pressure in the chamber during inertisation or flushing of CO<sub>2</sub>.
- 12 Burst disk**  
In the case of an explosion, there is a sudden release of gas and increase of pressure inside the chamber. A Burst disk is provided to release this pressure into an exhaust duct.

## Specifications

Test space volume (l)	400 to 2000
Temperature range (°C)	-70 to +200
Cooling Rate (°C/min)	1 to 5
Heating Rate (°C/min)	1 to 5
Humidity Range (% RH)	10 - 98



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