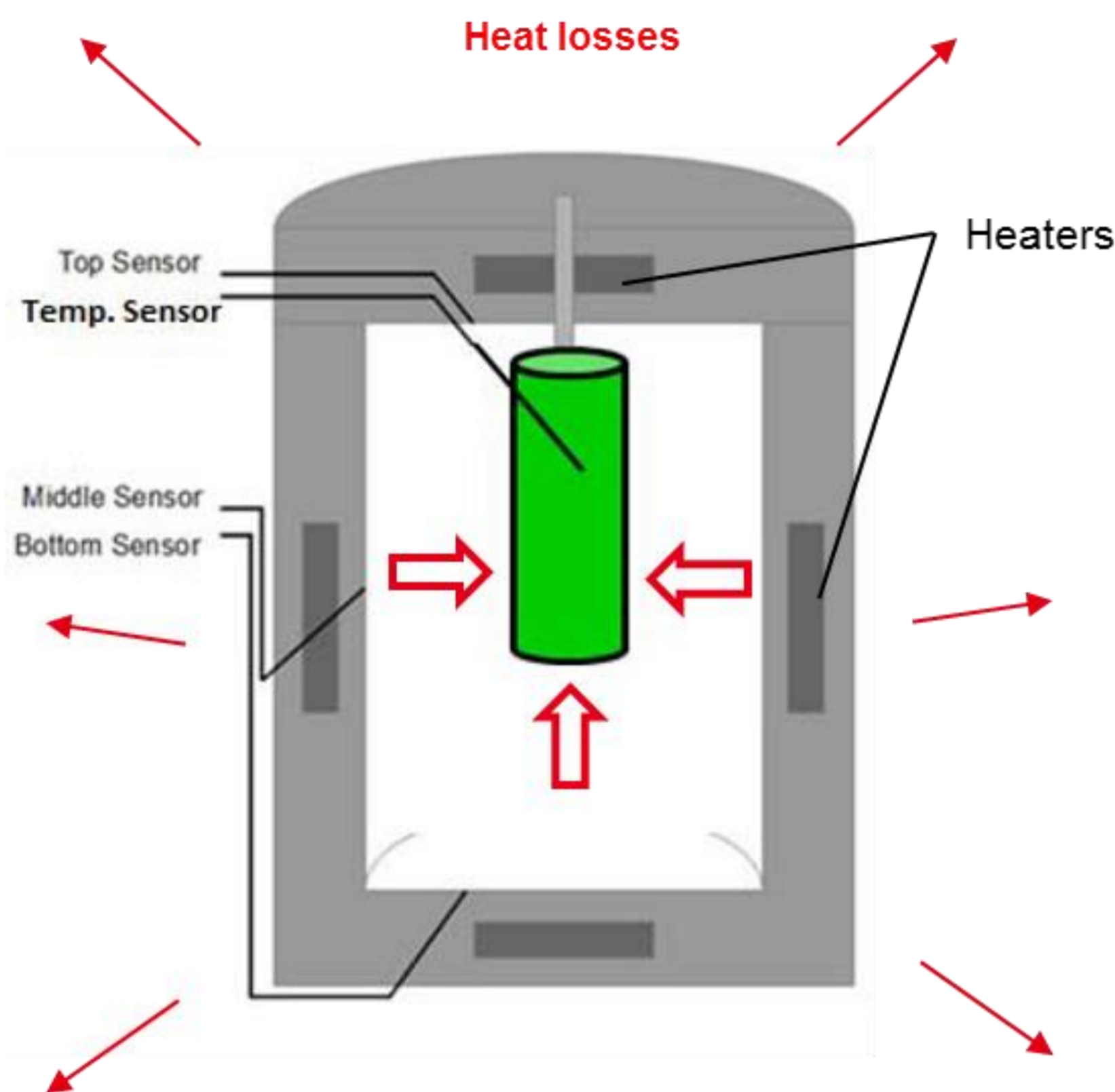


TESTS IN ABUSIVE CONDITIONS?

What ?

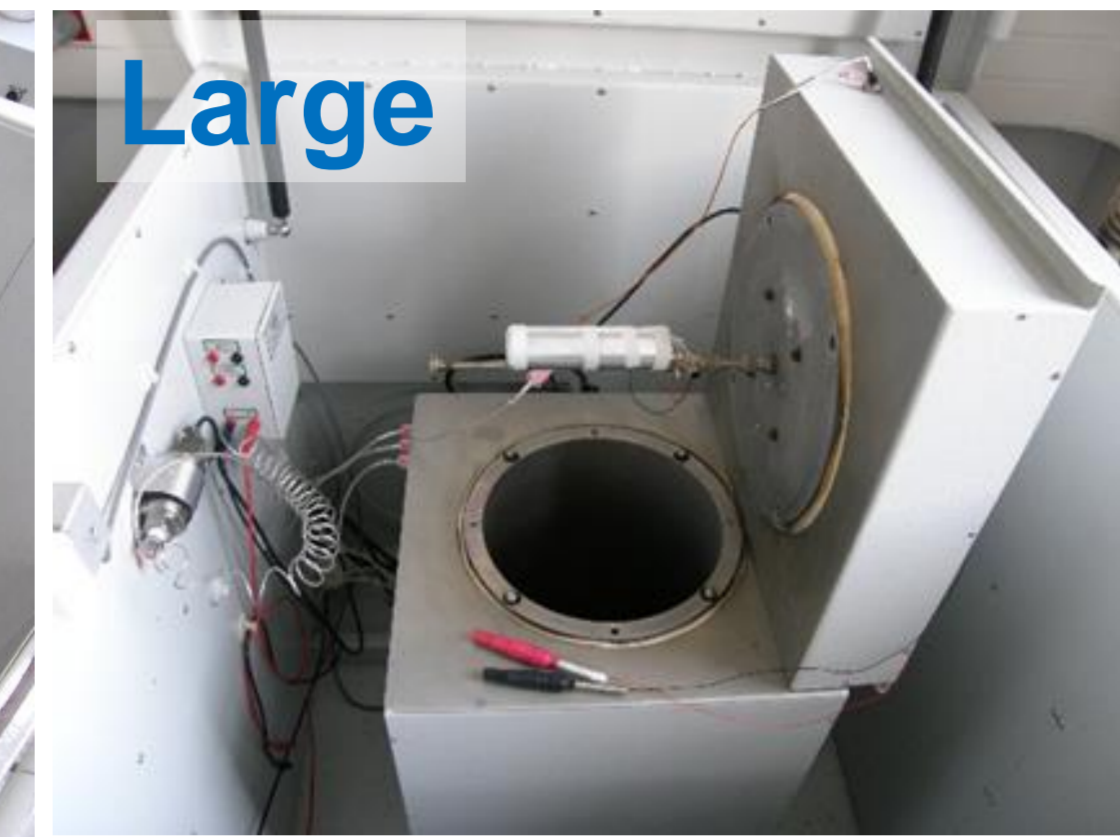


ARC test bench (Accelerated Rate Calorimeter).

3 different sizes



Small
 Ø10 cm x h10 cm
 Amb → 250°C
 Ex: Cells under tests:
 - Cylindrical: 18650 / 21700 / 26650
 - Prismatic: 5 x 34 x 37 mm



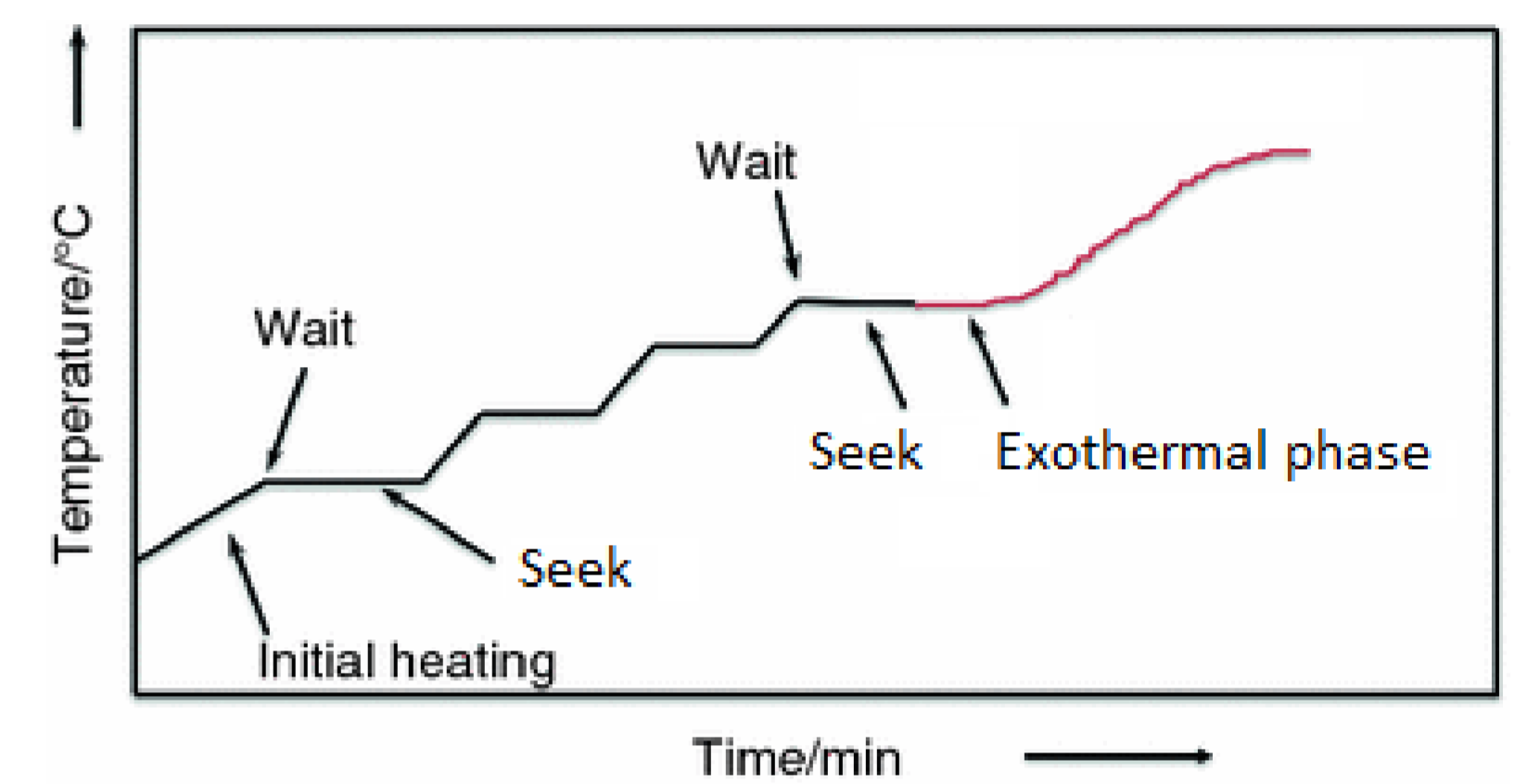
Large
 Ø25 cm x h50 cm
 Amb → 300°C
 Ex: Cells under tests:
 - Cylindrical: 18650 / 21700 / 26650 / 50125
 - Prismatic: 58 x 145 x 84 mm



XLarge
 Ø40 cm x h44 cm
 Amb → 250°C
 Ex: Cells under tests:
 - Cylindrical: Ø54 mm x h 250 mm
 - Prismatic: 17 x 99 x 310 mm

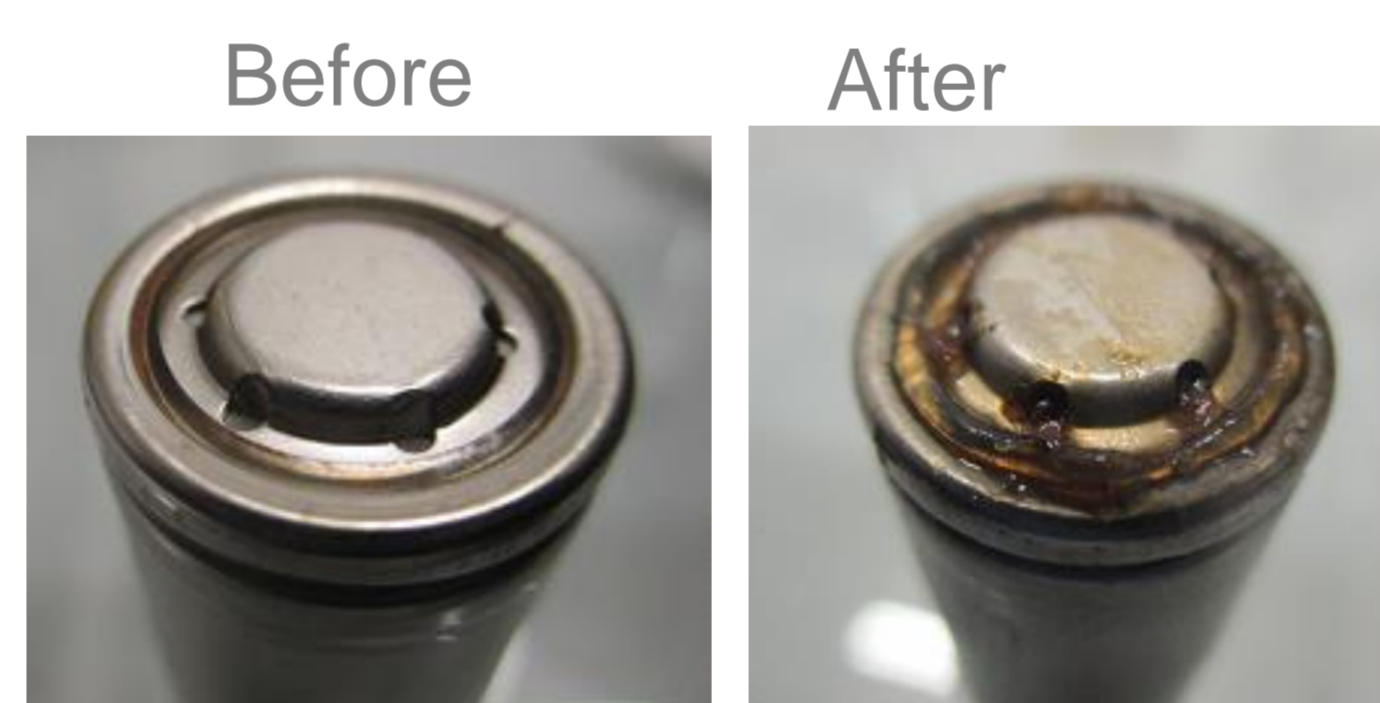
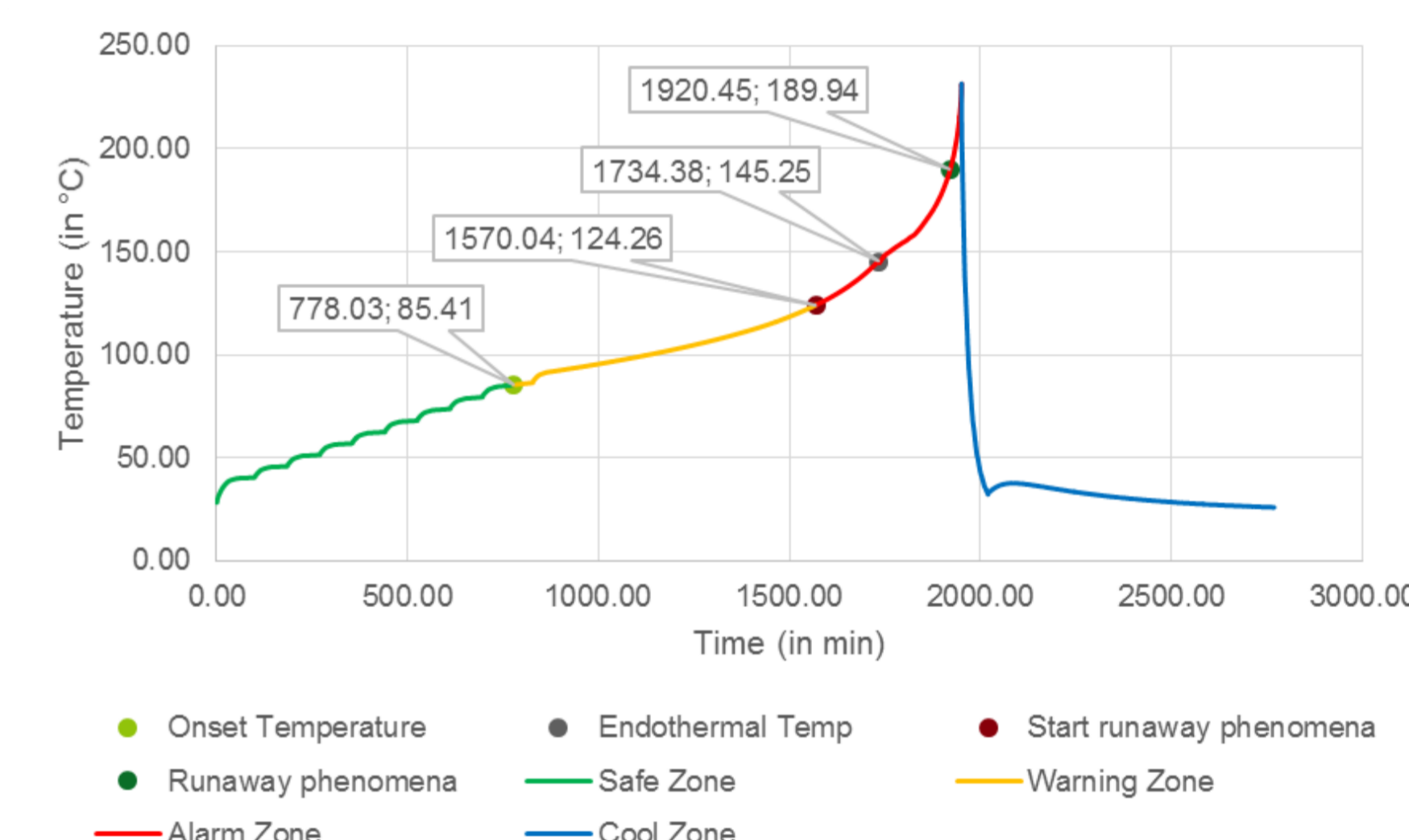
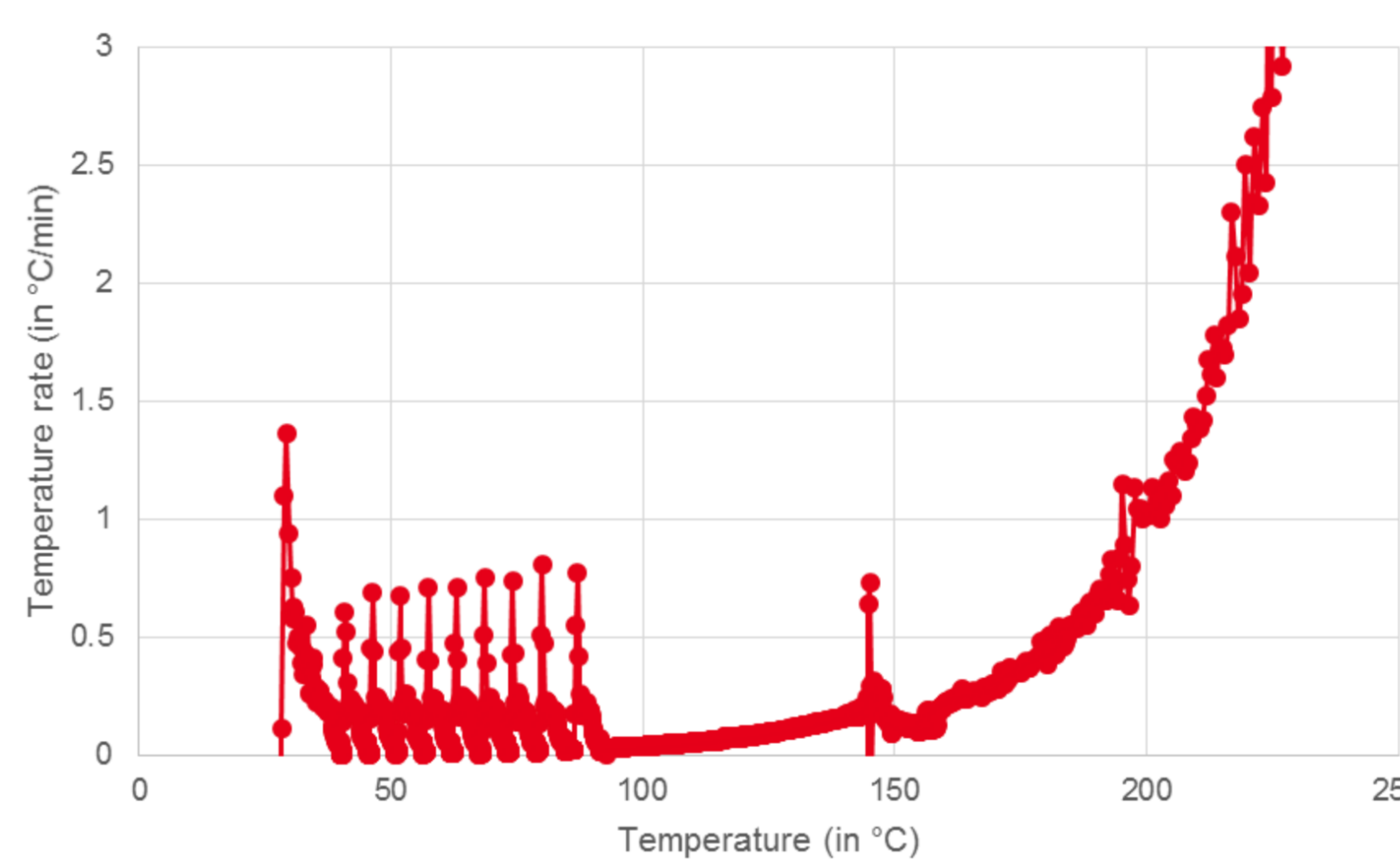
Why ?

- Adiabatic calorimeter
- Abusive conditions / safety testing campaign
 - External short circuit
 - Overcharge
 - Thermal stability
 - Volume of gas released / over pressure
 - ...



Example of results

- Thermal runaway
 - Onset temperature: XX °C
 - Temperature step during warning zone
 - Endothermal phenomenon (venting)
 - End of test on speed criteria
 - Mass losses > XX %



- Venting opening.
 - Gasket seal melted on the positive terminal.



- Swelling of the cell.
 - Fire flame.
 - Ejection of material

Main potential use:

- Safety tests (thermal stability, overcharge, external short circuit...)
- Energy released
- Volume of gas released
- Cp measurement

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Advantages:

- Different sizes of samples / cells
- Shielded enclosure
- Adiabatic (pseudo) conditions of operation
- Large range of temperature (-100 to 300 °C)
- Multisensing / gas sampling ...

Drawbacks:

- Quite long tests (calibration + test = 2 to 3 days)