

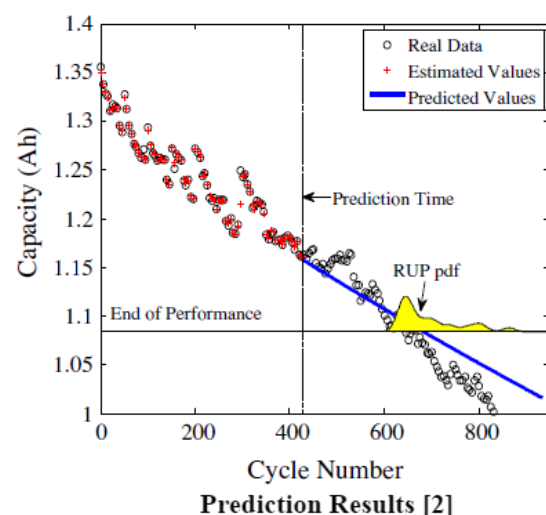
CX2 Battery

Source: <https://calce.umd.edu/battery-data#Storage>

Battery (Parameters)	Specifications (Value)
Capacity Rating	1350 mAh
Cell Chemistry	LiCoO2 cathode (EDS showed trace elements of Manganese)
Weight (w/o safety circuit)	28 g
Dimensions	6.6 x 33.8 x 50 mm
Special Notes	Jellyroll configuration wrapped around the "width" axis

Data and Test Description

All CX2 cells underwent the same charging profile which was a standard constant current/constant voltage protocol with a constant current rate of 0.5C until the voltage reached 4.2V and then 4.2V was sustained until the charging current dropped to below 0.05A. Some minor variations were incorporated in this standard charging profile for some of the CX2 cells mentioned below. Unless specified, the discharge cut off voltage for these batteries was 2.7V. All the CX2 cells were randomly numbered and named accordingly. Name 'CX2_n' was given for the nth numbered CX2 cell.



Each CX2 cell was cycled multiple times under the conditions mentioned adjacent to its name in the table below. The data files for each cell contain a collection of excel files of logged data generated from its testing. These excel files were named according to the testing dates. All cells except CX2_4 and CX2_31 were tested using the Arbin Battery Tester. CX2_4 and CX2_31 were tested using CADEX Battery Tester and hence data files for these cells are in .txt format. For the cell CX2_4, which was cycled at different temperatures, thermocouple data is also provided in the Temperature folder of CX2_4 data files. This data is in the .xlsx format and is available below for download.

Type 1 - Cycled at constant current of 0.5C:

CX2-16	CX2-31	CX2-33	CX2-35
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Type 2 - Cycled at constant current of 0.5C:

<u>CX2-34</u>	<u>CX2-36</u>	<u>CX2-37</u>	<u>CX2-38</u>
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Type 3 - Discharged at a constant current of 3C:

<u>CX2-8</u>

Type 4 - Discharged at a constant current of 0.5C to a cut-off voltage of 2.7V. After charging the battery was discharged with a pulsed current alternating between 0.5C and 1C each for 30 seconds until the voltage dropped to 3.2V. A 10 seconds rest period was applied after each discharge pulse. The profile was repeated over the cycle life of the cell:

<u>CX2-3</u>

Type 5 - Discharged at a constant current of 1C to a cut-off voltage of 2.7V. After every 10 charge/discharge cycles the ambient temperature was raised 10°C so that the cell was temperature cycled between 25°C, 35°C, 45°C and 55°C:

<u>CX2-4</u>

Type 6 - Cycled under a pulsed discharge loading profile. First a discharge rate of 0.5C was applied for 1 minute followed by a 5 minutes rest, and then 1C discharge rate was applied for 1 minute followed by a 5 minutes rest and finally 2C discharge rate was applied for 1 minute followed by a 5 minute rest. This was repeated until the cell reached its cut-off voltage:

<u>CX2-32</u>

The above data files have been referenced in:

[\[1\] Prognostics of lithium-ion batteries based on Dempster–Shafer theory and the Bayesian Monte Carlo method.](#)

Wei He, Nicholas Williard, Michael Osterman, Michael Pecht, *Journal of Power Sources*, 196(23), pp.10314-10321, 2011.

[\[2\] An Ensemble Model for Predicting the Remaining Useful Performance of Lithium-ion Batteries.](#)

Yinjiao Xing, Eden Ma, Kwok Leung Tsui, Michael Pecht, *Microelectronics Reliability*, 53(6), pp.811-820, 2013.