Supporting Information for ‘Dynamic Impact Response of Lithium-Ion Batteries, Constitutive Properties and Failure Model’

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**Pouch Cells**

\[ V = 0.005 \text{ m/s} \]

\[ V = 0.050 \text{ m/s} \]

\[ V = 0.500 \text{ m/s} \]

**Elliptical Cells**

\[ V = 0.001 \text{ m/s} \]

\[ V = 0.010 \text{ m/s} \]

\[ V = 0.100 \text{ m/s} \]

Figure S1 - Analytical (dashed lines) vs. experimental (solid lines) load-displacement response of pouch cells (Top) and elliptical cells (Bottom) at different crosshead velocities.

\[ \frac{A}{A_{\text{ref}}} = 0.0737 \ln \dot{\varepsilon}^* + 1 ; R^2 = 0.872 \]

\[ \frac{A}{A_{\text{ref}}} = 0.1031 \ln \dot{\varepsilon}^* + 1 ; R^2 = 0.994 \]

Figure S2. Linear relationship between the normalized fit coefficients \( \frac{A}{A_{\text{ref}}} \) and \( \ln \dot{\varepsilon}^* \) in a) pouch and b) elliptical cells.
A negative linear relationship was found between $\varepsilon_f$ and $\ln \dot{\varepsilon}^*$ in pouch cells for all mesh sizes studied (a, b, and c).

Figure S3.