We claim:

1. A prismatic battery cell comprising:

an outer cell case in which the contents of the battery cell are contained, the cell case presenting a pair of opposed, planar surfaces interconnected by a plurality of opposed sidewall segment pairs; and

a compressive wrap disposed around the cell case in covering relationship to at least a portion of the planar surfaces and at least a portion of one sidewall segment pair of the plurality of sidewall segment pairs, the compressive wrap being operable to constrain hoop stresses acting upon the cell case during thermal expansion of the battery cell,

there being at least one sidewall segment of one of the sidewall segment pair of the plurality of sidewall segment pairs that is uncovered by the compressive wrap and configured to create at least one predetermined point of cell case failure during a thermal event in the battery cell through which ejecta and gas are released from the battery cell.

2. The prismatic battery cell of claim 1, wherein the compressive wrap prevents failure of the cell case at any location on the cell case that is covered by the compressive wrap prior to failure at the at least one predetermined point.

3. The prismatic battery cell of claim 1 or 2, wherein compressive wrap comprises a tensile strength of at least 2.5 MPa.

4. The prismatic battery cell according to any one of claims 1 to 3, wherein the compressive wrap comprises a self-adhesive fiberglass reinforced film.

5. The prismatic battery cell according to any one of claims 1 to 4, wherein the at least one predetermined point of cell case failure is located at the intersection of two adjacent sidewall segments.

6. The prismatic battery cell according to any one of claims 1 to 5, wherein there are two sidewall segments of the one sidewall segment pair of the plurality of sidewall segment pairs that are uncovered by the compressive wrap, there being at least one predetermined point of cell case failure formed in each of the two

side wall segments of the one of the sidewall segment pair of the plurality of sidewall segment pairs.

7. The prismatic battery cell according to any one of claims 1 to 6, wherein the battery cell is a lithium ion battery cell.

8. A method of constraining a prismatic battery cell comprising a cell case in which the contents of the battery cell are contained, the cell case presenting a pair of opposed planar surfaces interconnected by a plurality of opposed sidewall segment pairs, the method comprising:

applying a compressive wrap to the cell case in covering relationship to at least a portion of the planar surfaces and a least a portion of one sidewall segment pair of the plurality of sidewall segment pairs, the compressive wrap functioning to constrain hoop stresses acting upon the cell case during thermal expansion of the battery cell, and

leaving at least one sidewall segment of the one sidewall segment pair of the plurality of sidewall segment pairs uncovered by the compressive wrap thereby creating at least one predetermined point of cell case failure during a thermal event in the battery cell through which ejecta and gas are released from the battery cell.

9. The method of claim 8, wherein the compressive wrap is a fiberglass reinforced film that is adhered to the cell case, and prevents failure of the cell case at any location on the cell case that is covered by the compressive wrap prior to failure at the predetermined point.

10. A battery module assembly comprising:

(1) a battery module housing configured to house a plurality of prismatic battery cells according to any one of claims 1 to 6;

and

(2) a layered barrier material disposed in between at least two battery cells of the plurality of prismatic battery cells, the layered barrier material

configured to thermally isolate and control or prevent cell-to-cell propagation of a thermal event occurring within at least one of the battery cells, the layered barrier material comprising:

(i) at least two sheets of an anisotropic material, at least one sheet of anisotropic material of the at least two sheets of anisotropic material being in direct facing contact with one battery cell of the at least two battery cells, and at least one other sheet of anisotropic material of the at least two sheets of anisotropic material being in direct facing contact with one other battery cell of the at least two battery cells;

(ii) optionally at least two sheets of a thermal insulation material, one sheet of the thermal insulation material of the at least two sheets of thermal insulation material being positioned in direct facing contact with one sheet of anisotropic material of the at least two sheets of anisotropic material, and the other sheet of thermal insulation material of the at least two sheets of thermal insulation material being positioned in direct facing contact with the other sheet of anisotropic material of the at least two sheets of anisotropic material; and

(iii) a compliant material positioned between the at least two sheets of thermal insulation material under compression, the compliant material being operable for maintaining the at least two sheets of anisotropic material in direct facing contact with the at least two battery cells.

11. The battery module assembly of claim 10, wherein the battery module housing comprises at least one composite panel comprising an outboard metallic or non-metallic structural layer, an inboard layer of an FR4-rated sheet material, and at least one graphitic carbon sheet positioned therebetween, wherein the composite panel defines at least in part a passageway configured to conduct a flow of ejecta and gas from a thermal event associated with one or more battery cells within the battery module housing toward an outlet formed in the housing, wherein the housing

further comprises at least one side panel positioned transversely relative to the composite panel, the outlet being formed in the at least one side panel, and wherein the outlet is normally covered with a rupturable diaphragm configured to open in response to the thermal event and permit communication between the passageway and the exterior of the housing.

12. The battery module assembly of claim 11, wherein the battery module assembly further comprises one or more busbars operable to connect the plurality of battery cells located within the housing, and one or more busbar shields configured to at least partially cover the one or more busbars and shield electrical components located outboard of the one or more busbars and within the passage from contacting the one or more busbars during a thermal event associated with one or more of the plurality of battery cells.

13. The battery module assembly according to any one of claims 10 to 12, wherein each of the plurality of battery cells comprises at least one cell flange extending from one or more of the sidewall segments, at least two terminals extend from one or more of the sidewall segments, the at least two terminals being at least partially surrounded by the at least one cell flange, there being at least one pliable, temperature-resistant strip of material disposed on at least one side of and overlying the at least one cell flange.

14. The battery module assembly according to any one of claims 10 to 13, wherein the layered barrier material comprises the at least two sheets of anisotropic material, the at least two sheets of thermal insulation material, and the compliant material.

15. A vehicle comprising a prismatic battery cell according to any of claims 1 to 7 or a battery module assembly according to any one of claims 10 to 14.