What is claimed is:

1. A battery module comprising:

a first battery cell and a second battery cell;

a heat control member comprising:

a first layer of a fiber reinforced aerogel composition having a first outer surface and a second outer surface opposite the first outer surface, the fiber reinforced aerogel composition including an opacifier present at a level of at least 5 to 20 percent by weight of the fiber reinforced aerogel composition;

a polymer compliant member disposed on a side of the first layer of the fiber reinforced aerogel composition corresponding to the first outer surface, the polymer compliant layer comprising one or more of polyolefins, polyurethanes, phenolics, melamine, cellulose acetate, and polystyrene; and

a thermally conductive material layer between the first layer of the fiber reinforced aerogel composition and the polymer compliant member;

wherein:

the second outer surface of the first layer of the fiber reinforced aerogel composition is disposed adjacent to the first battery cell.

2. The battery module of claim 1, wherein the first layer of the fiber reinforced aerogel composition has an uncompressed thickness in the range of 1 mm to 5 mm.

3. The battery module of claim 2, wherein the first layer of the fiber reinforced aerogel composition has an uncompressed thickness less than 3 mm.

4. The battery module of claim 2, wherein the first layer of the fiber reinforced aerogel composition has an uncompressed thickness less than 2 mm.

5. The battery module of claim 1, wherein the fiber reinforced aerogel composition comprises inorganic, organic, or inorganic/organic hybrid aerogel materials.

6. The battery module of claim 1, wherein the fiber reinforced aerogel composition comprises a silica aerogel composition.

7. The battery module of claim 1, wherein the heat control member has an uncompressed thickness in the range of 2 mm to 7 mm.

8. The battery module of claim 1, further comprising an encapsulation member forming at least one of the first outer surface or the second outer surface of the first layer of the fiber reinforced aerogel.

9. The battery module of claim 1, wherein the opacifier is present at a level of at least 10 to 20 percent by weight of the fiber reinforced aerogel composition.

10. The battery module of claim 1, wherein the opacifier is selected from the group consisting of boron carbide, diatomite, manganese ferrite, MnO, NiO, SnO, Ag2O, Bi2O3, carbon black, graphite, titanium oxide, iron titanium oxide, aluminum oxide, zirconium silicate, zirconium oxide, iron (II) oxide, iron (III) oxide, manganese dioxide, iron titanium oxide (ilmenite), chromium oxide, silicon carbide, titanium carbide, tungsten carbide, or mixtures thereof.

11. The battery module of claim 1, wherein the opacifier includes silicon carbide.

12. The battery module of claim 1, wherein the thermally conductive material layer includes at least one layer comprising metal, carbon, conductive polymer, or combinations thereof.

13. The battery module of claim 1, further comprising a thermally capacitive material.

14. A battery system comprising:

a battery module housing comprising an outer surface;

a battery module of claim 1 disposed within the battery module housing; and

an additional heat control member disposed between the second battery cell battery cell and the outer surface of the battery module housing.

15. The battery module of claim 1, wherein the heat control member further comprises:

a second layer of the fiber reinforced aerogel composition, wherein:

the second layer of the fiber reinforced aerogel composition has a first outer surface and a second outer surface opposite the first outer surface;

the first outer surface of the second layer of the fiber reinforced aerogel composition is adjacent to the polymer compliant member and on a side of the polymer compliant member opposite that of the first layer of the fiber reinforced aerogel composition; and

the second outer surface of the second layer of the fiber reinforced aerogel composition is adjacent to the second battery cell.

16. The battery module of claim 15, wherein the thermally conductive material layer is disposed between the first layer of the fiber reinforced aerogel composition and the second layer of the fiber reinforced aerogel composition.

17. The battery module of claim 1, wherein the fiber reinforced aerogel composition comprises fibers selected from the group consisting of discrete fibers, woven materials, non-woven materials, needled nonwovens, battings, webs, mats, felts, and combinations thereof.

18. The battery module of claim 1, wherein the fiber reinforced aerogel composition is lofty.

19. The battery module of claim 1, wherein the fiber reinforced aerogel composition is compressible by at least 50% of its uncompressed thickness and sufficiently resilient to return to at least 70% of its uncompressed thickness after compression and release.

20. The battery module of claim 1, wherein the fiber reinforced aerogel composition has a liquid water uptake of less than 15 wt %.

21. The battery module of claim 1, wherein the heat control member has a thermal conductivity of from 10 mW/mk to 30 mW/mK.

22. The battery module of claim 1, wherein when the second outer surface is exposed to a temperature of 650° C. or above, the heat control member maintains a temperature of 120° C. or below at the first outer surface for at least 1 minute.

23. The battery module of claim 1, wherein when the second outer surface is exposed to a temperature of 650° C. or above, the heat control member maintains a temperature of 180° C. or below at the first outer surface for at least about 4 minutes.

24. A battery system comprising:

a battery module that includes at least one battery cell; and

a heat control member that includes:

a layer of a fiber reinforced aerogel composition having a first outer surface and a second outer surface opposite the first outer surface, the fiber reinforced aerogel composition including an opacifier present at a level of at least about 5 to 20 percent by weight of the fiber reinforced aerogel composition;

a polymer compliant member disposed on a side of the layer of the fiber reinforced aerogel composition corresponding to the first outer surface, the polymer compliant layer comprising one or more of polyolefins, polyurethanes, phenolics, melamine, cellulose acetate, and polystyrene; and

a thermally conductive material layer between the layer of the fiber reinforced aerogel composition and the polymer compliant member;

wherein:

the thermally conductive material layer is adjacent to the first outer surface of the layer of the fiber reinforced aerogel composition; and

the second outer surface of the layer of the fiber reinforced aerogel composition is adjacent to a surface of the battery module.

25. A battery pack comprising:

battery pack outer surfaces;

at least one battery cell disposed within a space defined by the battery pack outer surfaces; and

a heat control member that includes:

a layer of a fiber reinforced aerogel composition having a first outer surface and a second outer surface opposite the first outer surface, the fiber reinforced aerogel composition including an opacifier present at a level of at least 5 to 20 percent by weight of the fiber reinforced aerogel composition;

a polymer compliant member disposed on a side of the layer of the fiber reinforced aerogel composition corresponding to the first outer surface, the polymer compliant layer comprising one or more of polyolefins, polyurethanes, phenolics, melamine, cellulose acetate, and polystyrene; and

a thermally conductive material layer between the layer of the fiber reinforced aerogel composition and the polymer compliant member;

wherein:

the thermally conductive material layer is adjacent to the first outer surface of the layer of the fiber reinforced aerogel composition; and

the second outer surface of the layer of the fiber reinforced aerogel composition is adjacent to the battery pack outer surfaces.

26. The battery pack of claim 25, wherein the fiber reinforced aerogel composition includes an encapsulation member.