CLAIMS

1. A textile composition, comprising:

an inactivated fungal biomass; and

a polymer, wherein the polymer is infiltrated into the inactivated fungal biomass to a fungal biomass:polymer loading ratio of between about 25:75 and about 75:25, and

wherein the textile composition has a tensile strength of at least about 2 MPa.

2. The textile composition of claim 1, further comprising at least one component selected from the group consisting of a plasticizer, a crosslinker, and a dye, wherein the polymer and the at least one component are distributed in the inactivated fungal biomass.

3. The textile composition of claim 1 or 2, having a thickness of at least about 1 mm.

4. The textile composition of any one of claims 1-3, having a tear force of at least about 30 N.

5. The textile composition of any one of claims 1-4, having a tear strength of at least about 10 N/mm.

6. The textile composition of any one of claims 1-5, having a flexural rigidity of no more than about 5 gram-centimeters.

7. The textile composition of any one of claims 1-6, wherein the tensile strength of the textile composition is between about 2 MPa and about 8 MPa.

8. The textile composition of any one of claims 1-7, having a water spotting grey scale rating of at least about 3.

9. The textile composition of any one of claims 1-8, having a light color fastness blue wool rating of at least about 4.

10. The textile composition of any one of claims 1-9, having a rub color fastness grey scale rating, when dry, of at least about 3.

11. The textile composition of any one of claims 1-10, having a rub color fastness grey scale rating, when wet, of at least about 2.

12. The textile composition of any one of claims 1-11, having a strain at break of between about 75% and about 275%.

13. The textile composition of any one of claims 1-12, having a degree of swelling of between about 200% and about 450%.

14. The textile composition any one of claims 1-13, having a mass loss upon soaking of between about 20% and about 60%.

15. A textile composition, comprising:

an inactivated fungal biomass;

a polymer; and

at least one backing layer of a non-fungal textile material,

wherein the polymer is infiltrated into the inactivated fungal biomass to a fungal biomass:polymer loading ratio of between about 25:75 and about 75:25.

16. The textile composition of claim 15, wherein the non-fungal textile material is selected from the group consisting of an acrylic textile, an alpaca textile, an angora textile, a cashmere textile, a coir textile, a cotton textile, an eisengarn textile, a hemp textile, a jute textile, a Kevlar textile, a linen textile, a microfiber textile, a mohair textile, a nylon textile, an olefin textile, a pashmina textile, a polyester textile, a piña textile, a ramie textile, a rayon textile, a sea silk textile, a silk textile, a sisal textile, a spandex textile, a spider silk textile, a wool textile, and combinations and mixtures thereof.

17. The textile composition of claim 15 or 16, further comprising at least one component selected from the group consisting of a plasticizer, a crosslinker, and a dye, wherein the polymer and the at least one component are distributed in the inactivated fungal biomass.

18. The textile composition of any one of claims 15-17, having a tear force of at least about 30 N.

19. The textile composition of any one of claims 15-18, having a tear strength of at least about 10 N/mm.

20. The textile composition of any one of claims 15-19, having a flexural rigidity of no more than about 5 gram-centimeters.

21. The textile composition of any one of claims 15-20, wherein the tensile strength of the textile composition is between about 2 MPa and about 8 MPa.

22. The textile composition of any one of claims 15-21, having a water spotting grey scale rating of at least about 3.

23. The textile composition of any one of claims 15-22, having a rub color fastness grey scale rating, when dry, of at least about 3.

24. The textile composition of any one of claims 15-23, having a strain at break of between about 75% and about 275%.

25. The textile composition of any one of claims 15-24, having a degree of swelling of between about 200% and about 450%.

26. The textile composition of any one of claims 15-25, having a mass loss upon soaking of between about 20% and about 60%.

27. A textile composition, comprising:

an inactivated fungal biomass;

a polymer; and

a thermal dopant,

wherein the polymer is infiltrated into the inactivated fungal biomass to a fungal biomass:polymer loading ratio of between about 25:75 and about 75:25.

28. The textile composition of claim 27, wherein the thermal dopant is selected from the group consisting of a ceramic material, a metallic material, a polymeric material, and combinations and mixtures thereof.

29. The textile composition of claim 27 or 28, wherein the thermal dopant is selected from the group consisting of activated charcoal, aluminum oxide, bentonite, diatomaceous earth, ethylene vinyl acetate, lignin, nanosilica, polycaprolactone, polylactic acid, silicone, and yttrium oxide.

30. The textile composition of any one of claims 27-29, wherein a thermal characteristic of the textile composition is altered relative to the same thermal characteristic of the textile composition in the absence of the thermal dopant, wherein the thermal characteristic is selected from the group consisting of thermal effusivity, thermal conductivity, heat capacity, and combinations thereof.