Claims

What is claimed is:

1. A dressing for treating a tissue site with negative pressure, the dressing comprising:
   a first layer having a first side, a second side, and fenestrations including raised edges extending from the first side, wherein the raised edges are configured to be collapsed into contact with each other at rest and to separate in response to a pressure gradient across the first layer;
   a second layer adjacent to the first side, the second layer comprising a manifold; and
   a cover coupled to the second layer opposite the first layer, the cover comprising a polymer drape.

2. The dressing of claim 1, wherein the first layer is hydrophobic.

3. The dressing of claim 1, wherein:
   the first layer is hydrophobic;
   the manifold is hydrophobic; and
   the first layer is more hydrophobic than the manifold.

4. The dressing of claim 1, wherein the first layer comprises a polymer film having a contact angle with water greater than 90 degrees.

5. The dressing of claim 1, wherein the fenestrations are configured to restrict liquid transfer across the first layer from the first side to the second side.

6. The dressing of claim 1, wherein the first layer is configured to be interposed between the manifold and the tissue site and at least partially exposed to the tissue site.

7. The dressing of claim 1, wherein the fenestrations are coextensive with the first layer.

8. The dressing of claim 1, wherein the fenestrations are coextensive with the manifold.

9. The dressing of claim 1, wherein the fenestrations are distributed across the first layer in a uniform pattern.

10. The dressing of claim 1, wherein the fenestrations are distributed across the first layer in a grid of parallel rows and columns.

11. The dressing of claim 1, wherein:

    the fenestrations are distributed across the first layer in parallel rows and columns;

    the parallel rows are spaced about 3 millimeters on center; and

    the fenestrations in each of the parallel rows are spaced about 3 millimeters on center.

12. The dressing of claim 1, wherein the first layer has a substantially flat surface.

13. The dressing of claim 1, wherein the fenestrations are asymmetrical.

14. The dressing of claim 1, wherein the first layer is welded to the second layer.

15. The dressing of claim 1, wherein:

    the first layer is hydrophobic; and

    the first layer is welded to the manifold.

16. The dressing of claim 1, wherein the first layer comprises or consists of a polyethylene film or an ethyl methyl acrylate film.

17. The dressing of claim 1, wherein the first layer comprises or consists essentially of a polyethylene film having an area density of less than 30 grams per square meter.

18. The dressing of claim 1, wherein:

    the first layer comprises or consists essentially of a polyethylene film or an ethyl methyl acrylate film; and

    the first layer is welded to the manifold.

19. The dressing of claim 1, wherein:

    the first layer comprises or consists essentially of a polyethylene film or an ethyl methyl acrylate film;

    the manifold comprises polyurethane foam; and

    the first layer is welded to the manifold.

20. The dressing of claim 1, wherein:

the first layer comprises or consists essentially of a polyethylene film;

the manifold comprises polyurethane foam; and

the polyethylene film is welded to the manifold with polar interfaces.

21. The dressing of claim 1, wherein:

the first layer comprises or consists essentially of a polyethylene film laminated to an ethyl methyl acrylate film;

the manifold comprises polyurethane foam; and

the ethyl methyl acrylate film is welded to the manifold.

22. The dressing of claim 1, wherein:

the first layer comprises or consists essentially of a polyethylene film laminated to at least one of a film of polyamide, co-polyesters, ionomers, and acrylics; and

the first layer is welded to the manifold.

23. The dressing of claim 1, further comprising a tie layer between the first layer and the second layer.

24. The dressing of claim 1, wherein the first layer comprises a coating of silicone.

25. The dressing of claim 1, wherein the first layer comprises a coating of fluorocarbons.

26. The dressing of claim 1, further comprising a fourth layer coupled to the first layer opposite the second layer, the fourth layer comprising a hydrophobic gel having a plurality of apertures.

27. The dressing of claim 1, further comprising a fourth layer coupled to the first layer opposite the second layer, the fourth layer comprising a hydrophobic gel having apertures in registration with at least some of the fenestrations in the first layer.

28. The dressing of claim 1, further comprising a fourth layer coupled to the first layer opposite the second layer, the fourth layer comprising a hydrophobic gel having a plurality of apertures configured to expose at least a portion of one of the fenestrations.

29. The dressing of claim 1, further comprising a fourth layer coupled to the first layer opposite the second layer, the fourth layer comprising a hydrophobic gel having a plurality of apertures wherein the apertures limit an effective size of the fenestrations.

30. A dressing for treating a tissue site with negative pressure, the dressing comprising:

a first layer comprising a film having perforations and fenestrations through the film that are configured to expand in response to a pressure gradient across the film, wherein the perforations include holes and the fenestrations include raised edges;

a second layer adjacent to the first layer, the second layer comprising a manifold; and

a cover adjacent to the second layer opposite the first layer.

31. The dressing of claim 30, wherein:

the film has a central zone and a peripheral zone;

the manifold is at least partially disposed adjacent to the central zone;

the perforations are disposed in the central zone; and

the fenestrations are disposed in the peripheral zone.

32. The dressing of claim 30, wherein:

the film has a central zone;

at least some of the perforations and the fenestrations are disposed in the central zone; and

a ratio of the perforations to the fenestrations in the central zone is greater than 1:1.

33. The dressing of claim 30, wherein:

the film has a central zone;

at least some of the perforations and the fenestrations are disposed in the central zone; and

a ratio of the perforations to the fenestrations in the central zone is about 8:2.

34. The dressing of claim 30, wherein:

the film has a peripheral zone;

at least some of the perforations and the fenestrations are disposed in the peripheral zone; and

a ratio of the perforations to the fenestrations in the peripheral zone is less than 1:1.

35. The dressing of claim 30, wherein:

the film has a peripheral zone;

at least some of the perforations and the fenestrations are disposed in the peripheral zone; and

a ratio of the perforations to the fenestrations in the peripheral zone is no greater than 2:8.

36. The dressing of claim 30, wherein:

the film has a first zone and a second zone;

a ratio of the perforations to the fenestrations in the first zone is greater than 1:1; and

a ratio of the perforations to the fenestrations in the second zone is less than 1:1.

37. The dressing of claim 30, wherein:

the film has a first zone and a second zone;

a ratio of the perforations to the fenestrations in the first zone is about 8:2; and

a ratio of the perforations to the fenestrations in the second zone is about 2:8.

38. The dressing of claim 30, wherein:

the film has a manifolding area comprising a central zone and a peripheral zone;

the central zone is coextensive with about 50% of the manifolding area;

the peripheral zone is coextensive with about 50% of the manifolding area;

a ratio of the perforations to the fenestrations in the central zone is greater than 1:1; and

a ratio of the perforations to the fenestrations in the peripheral zone is less than 1:1.

39. The dressing of claim 30, wherein:

the film has a manifolding area comprising a central zone and a peripheral zone;

the central zone is coextensive with about 50% of the manifolding area;

the peripheral zone is coextensive with about 50% of the manifolding area;

a ratio of the perforations to the fenestrations in the central zone is about 8:2; and

a ratio of the perforations to the fenestrations in the peripheral zone is about 2:8.

40. The dressing of claim 30, wherein:

the film has a manifolding area comprising a central zone and a peripheral zone;

the central zone is coextensive with about 50% of the manifolding area;

the peripheral zone is coextensive with about 50% of the manifolding area;

the manifold is at least partially disposed adjacent to the central zone;

a ratio of the perforations to the fenestrations in the central zone is about 8:2; and

a ratio of the perforations to the fenestrations in the peripheral zone is about 2:8.

41. A dressing for treating a tissue site with negative pressure, the dressing comprising:

a fluid control layer comprising a polymer film including fluid restrictions that are elastomeric and configured to be responsive to a pressure gradient across the fluid control layer;

a manifold layer adjacent to the fluid control layer;

a cover adjacent to the manifold layer opposite the fluid control layer; and

a sealing layer adjacent to the fluid control layer opposite the manifold layer, the sealing layer comprising apertures aligned with the fluid restrictions;

wherein the fluid control layer and the sealing layer each have a contact angle with water of at least 70 degrees;

wherein the fluid control layer and the sealing layer are each less than 100 microns thick; and

wherein the fluid control layer and the sealing layer have a hardness in a range of 20 Shore A to 90 Shore A.

42. The dressing of claim 41, wherein the fluid control layer comprises a polymer film of polylactic acid, carboxymethyl cellulose, or polycaprolactone.

43. The dressing of claim 41, wherein the fluid control layer comprises a film of xanthan gum mixed with at least one of collagen, oxidized regenerated cellulose, and alginate.

44. The dressing of claim 41, wherein the fluid control layer comprises a film of xanthan gum and citric acid mixed with at least one of collagen, oxidized regenerated cellulose, and alginate.

45. The dressing of claim 41, wherein the fluid control layer comprises a film co-polymerized with dialkylcarbamoylchloride.

46. The dressing of claim 41, wherein the fluid control layer comprises a film coated with petrolatum gel.

47. The dressing of claim 41, wherein the fluid control layer comprises a film coated with petrolatum gel having a viscosity of at least 10000 millipascal seconds.

48. The dressing of claim 41, wherein the fluid control layer comprises a film coated with petrolatum gel having a viscosity of at least 10000 millipascal seconds and anti-microbial compounds.

49. The dressing of claim 41, wherein the fluid control layer comprises a film coated with petrolatum gel, the film formed from at least one of polyethylene, polyurethane, and ethyl methyl acrylate.

50. The dressing of claim 41, wherein the fluid control layer comprises a film coated with petrolatum gel having a viscosity of at least 10000 millipascal seconds and anti-microbial compounds, the film formed from at least one of polyethylene, polyurethane, and ethyl methyl acrylate.

51. The dressing of claim 41, wherein the manifold layer comprises felted polyurethane foam having open cells.

52. The dressing of claim 41, wherein the manifold layer comprises felted polyurethane foam having open cells and a thickness in a range of 2 millimeters to 5 millimeters.

53. The dressing of claim 41, wherein the manifold layer comprises:

foam having open cells formed from felted polyurethane; and

perforations through the foam.

54. The dressing of claim 41, wherein the manifold layer comprises a 3D textile.

55. The dressing of claim 41, wherein the manifold layer comprises at least two layers of woven textile with inter-woven polymer strands.

56. The dressing of claim 41, wherein the manifold layer comprises a wicking layer.

57. The dressing of claim 41, wherein the manifold layer comprises an absorbent.

58. The dressing of claim 41, wherein the manifold layer comprises:

    a first wicking layer;

    a second wicking layer; and

    an absorbent disposed between the first wicking layer and the second wicking layer.

59. The dressing of claim 41, wherein the manifold layer comprises at least two sheets formed of sodium carboxymethylcellulose.

60. The dressing of claim 41, wherein the manifold layer comprises a polymer mesh.

61. The dressing of claim 41, wherein the manifold layer comprises a polymer mesh having an open area of at least 70%.

62. The dressing of claim 41, wherein the manifold layer comprises polymer beads and at least some of the fluid restrictions are fluidly coupled with spaces between the polymer beads.

63. The dressing of claim 41, wherein the manifold layer comprises polymer projections and at least some of the fluid restrictions are fluidly coupled with spaces between the polymer projections.

64. The dressing of claim 41, wherein the manifold layer comprises an embossed polymer film.

65. The dressing of claim 41, wherein the manifold layer comprises cellulose.

66. The dressing of claim 41, wherein the manifold layer comprises a layer of non-woven material.

67. The dressing of claim 41, wherein the manifold layer comprises foam having closed cells and perforations through the foam.

68. The dressing of claim 41, wherein the manifold layer comprises:

a film substrate;

a plurality of fibers extending from the film substrate; and

perforations or fenestrations in the film substrate.