WHAT IS CLAIMED:

1. A multizone, unsupported, microporous, high throughput filtration membrane having a bubble point (in psi) of from about 15 to 50 and a breaking strain of at least 20%, comprising:

a first microporous zone which is symmetric or asymmetric;

a second microporous zone which is symmetric or asymmetric; and

a third microporous zone which is asymmetric, wherein the third microporous zone is positioned between the first and second microporous zones with the first, second, and third microporous zones being integral with one another and wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi), or a throughput, when using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi).

2. The membrane of claim 1, wherein the first microporous zone is 5-140 µm thick, the second microporous zone is 10-140 µm thick, and the third microporous zone is 50-140 µm thick.

3. The membrane of claim 1, wherein the membrane has a total thickness of 65-300 µm.

4. The membrane of claim 1, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi).

5. The membrane of claim 4, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1188.5, where x is the bubble point (in psi).

6. The membrane of claim 5, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1288.5, where x is the bubble point (in psi).

7. The membrane of claim 1, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi).

8. The membrane of claim 7, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1469.4, where x is the bubble point (in psi).

9. The membrane of claim 8, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1569.4, where x is the bubble point (in psi).

10. The membrane of claim 1, wherein the membrane has a breaking strain of at least 25%.

11. The membrane of claim 10, wherein the membrane has a breaking strain of at least 30%.

12. The membrane of claim 1, wherein the first, second, and third microporous zones comprise one or more polymers independently selected from the group consisting of PVDF, polyamides, polyimides, polyether sulphones, polysulphones, polyaryl sulphones, PVC, PET, polycarbonates, cellulose, regenerated cellulose, cellulose esters, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, and copolymers of acrylic or methacrylic polymers.

13. The membrane of claim 1, wherein the first, second, and/or third microporous zones are hydrophilic.

14. The membrane of claim 13, wherein the first, second, and/or third microporous zones comprise a hydrophilic polymer independently selected from the group consisting of polyacrylic acid, polyvinylalcohol, polyvinylacetate, polyvinylpyrrolidone, polyethyleneglycol, polyvinylpyridine, polyethyleneimine, and polyoxazoline.

15. The membrane according to claim 14, wherein the hydrophilic polymer comprises poly (2-ethyl-2-oxazoline).

16. The membrane according to claim 14, wherein the hydrophilic polymer is cross-linked.

17. The membrane according to claim 16, wherein the hydrophilic polymer is cross-linked by electron beam.

18. The membrane according to claim 17, wherein the hydrophilic polymer is cross-linked by electron beam with a dose of from about 20 to 150 kGy.

19. The membrane of claim 14, wherein the first, second, and/or third microporous zones independently comprise polyether sulfone, and poly (2-ethyl-2-oxazoline).

20. The membrane of claim 1, wherein the membrane is capable of being pleated without degradation of membrane retentive performance.

21. The membrane of claim 1, wherein the membrane is pleated.

22. The membrane of claim 1 further comprising:
a hydrophilic coating over the membrane.

23. A filtration cartridge comprising:
a housing; and
the membrane of claim 1 positioned within the housing.

24. The cartridge of claim 23, wherein the first microporous zone is 5-140 μm thick, the second microporous zone is 10-140 μm thick, and the third microporous zone is 50-140 μm thick.

25. The cartridge of claim 23, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi).

26. The cartridge of claim 25, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1188.5, where x is the bubble point (in psi).

27. The cartridge of claim 26, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1288.5, where x is the bubble point (in psi).

28. The cartridge of claim 23, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi).

29. The cartridge of claim 28, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1469.4, where x is the bubble point (in psi).

30. The cartridge of claim 29, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1569.4, where x is the bubble point (in psi).

31. The cartridge of claim 23, wherein the membrane has a breaking strain of greater than 25%.

32. The cartridge of claim 31, wherein the membrane has a breaking strain of greater than 30%.

33. The cartridge of claim 23, wherein the first, second, and third microporous zones comprise one or more polymers independently selected from the group consisting of PVDF, polyamides, polyimides, polyether sulphones, polysulphones, polyaryl sulphones, PVC, PET, polycarbonates, cellulose, regenerated cellulose, cellulose esters, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, and copolymers of acrylic or methacrylic polymers.

34. The cartridge of claim 23, wherein the first, second, and/or third microporous zones are hydrophilic.

35. The cartridge of claim 34, wherein the first, second, and/or third microporous zones comprise a blend of one or more polymers independently selected from the group consisting of PVDF, polyamides, polyimides, polyether sulphones, polysulphones, polyaryl sulphones, PVC, PET, polycarbonates, cellulose, regenerated cellulose, cellulose esters, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, and copolymers of acrylic or methacrylic polymers; and one or more hydrophilic polymers selected from the group consisting of polyacrylic acid, polyvinylalcohol, polyvinylacetate, polyvinylpyrrolidone, polyethyleneglycol, polyvinylpyridine, polyethyleneimine, and polyoxazoline.

36. The cartridge of claim 35, wherein the hydrophilic polymer comprises poly (2-ethyl-2-oxazoline).

37. The cartridge of claim 35, wherein the hydrophilic polymer is cross-linked.

38. The cartridge of claim 37, wherein the hydrophilic polymer is cross-linked by electron beam.

39. The cartridge of claim 38, wherein the hydrophilic polymer is cross-linked by electron beam at a dose of from about 20 to 150 kGy.

40. The cartridge of claim 23, wherein the membrane is pleated.

41. The process of forming a multizoned, microporous, high throughput filtration membrane, with a breaking strain of at least 20%, comprising:

providing solutions of a polymer and a solvent for said polymer;

simultaneously or sequentially casting the solutions as 3 separate zones onto a support to form a multizone liquid sheet;

effecting a phase separation of the 3 separate zones of solutions; and

separating the multizone, microporous, high throughput filtration membrane from the support, wherein the membrane comprises:

a first microporous zone which is symmetric or asymmetric;

a second microporous zone which is symmetric or asymmetric; and

a third microporous zone which is asymmetric, wherein the third microporous zone is positioned between the first and second microporous zones with the first, second, and third microporous zones being integral with one another, and wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi) or a throughput, when using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi).

42. The process of claim 41, wherein the first microporous zone is 5-140 μm thick, the second microporous zone is 10-140 μm thick, and the third microporous zone is 50-140 μm thick.

43. The process of claim 41, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi).

44. The process of claim 43, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1188.5, where x is the bubble point (in psi).

45. The process of claim 44, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1288.5, where x is the bubble point (in psi).

46. The process of claim 41, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi).

47. The process of claim 46, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1469.4, where x is the bubble point (in psi).

48. The process of claim 47, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1569.4, where x is the bubble point (in psi).

49. The process of claim 41, wherein the membrane has a breaking strain of greater than 25%.

50. The process of claim 49, wherein the membrane has a breaking strain of greater than 30%.

51. The process of claim 41, wherein the first, second, and third microporous zones comprise one or more polymers independently selected from the group consisting of PVDF, polyamides, polyimides, polyether sulphones, polysulphones, polyaryl sulphones, PVC, PET, polycarbonates, cellulose, regenerated cellulose, cellulose esters, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, and copolymers of acrylic or methacrylic polymers.

52. The process of claim 41, wherein the first, second, and/or third microporous zones are hydrophilic.

53. The process of claim 41, wherein the first, second, and/or third microporous zones further comprise one or more hydrophilic polymers independently selected from the group consisting of polyacrylic acid, polyvinylalcohol, polyvinylacetate, polyvinylpyrrolidone, polyethyleneglycol, polyvinylpyridine, polyethyleneimine, and polyoxazoline.

54. The process of claim 53, wherein the hydrophilic polymer comprises poly (2-ethyl-2-oxazoline).

55. The process of claim 53, wherein the hydrophilic polymer is cross-linked.

56. The process of claim 55, wherein the hydrophilic polymer is cross-linked by electron beam.

57. The process of claim 56, wherein the hydrophilic polymer is cross-linked by electron beam at a dose of from about 20 to150 kGy.

58. The process of claim 41, wherein the membrane is pleated.

59. The process of claim 41, wherein the solutions comprise at least one polymer and at least one solvent for the polymer.

60. The process of claim 41, wherein the solutions have an upper critical solution temperature.

61. The process of claim 41, wherein the solutions have a lower critical solution temperature.

62. The process of claim 61, wherein said effecting phase separation is carried out by heating the solutions above their lower critical solution temperature to cause phase separation.

63. The process of claim 41, wherein said effecting phase separation is carried out by vapor induced phase separation.

64. The process of claim 41, wherein the solutions further comprise one or more porogens independently selected from a group consisting of formamide, alcohols, polyhydric compounds, water, polyethylene glycol, calcium chloride, and lithium chloride.

65. The process of claim 41 further comprising:
coating a hydrophilic substrate on the membrane.

66. The process of claim 41, wherein said casting is carried out sequentially.

67. The process of claim 41, wherein said casting is carried out simultaneously.

68. The process of claim 67, wherein said casting is carried out by co-casting.

69. A multizone, unsupported, microporous, high throughput filtration membrane comprising:

a membrane having a first microporous zone which is symmetric or asymmetric;

a second microporous zone which is symmetric or asymmetric; and

a third microporous zone which is asymmetric, wherein the third microporous zone is positioned between the first and second microporous zones with the first, second, and third microporous zones being integral with one another and wherein the first, second, and/or third microporous zones comprise a blend of a first polymer selected from the group consisting of PVDF, polyamides, polyimides, polyether sulphones, polysulphones, polyaryl sulphones, PVC, PET, polycarbonates, cellulose, regenerated cellulose, cellulose esters, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, and copolymers of acrylic or methacrylic polymers, and a second polymer wherein the second polymer is selected from one or more hydrophilic polymers from the group consisting of polyacrylic acid, polyvinylalcohol, polyvinylacetate, polyvinylpyrrolidone, polyethyleneglycol, polyvinylpyridine, polyethyleneimine, and polyoxazoline and wherein the membrane has a breaking strain of at least 20%, and has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi), or a throughput, when using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi).

70. The membrane of claim 69, wherein the first polymer is PES and the second polymer is poly (2-ethyl-2-oxazoline).

71. The membrane of claim 69, wherein the membrane is cross-linked.

72. The membrane of claim 71, wherein the first polymer is PES and the second polymer is a polyoxazoline and the membrane is crossed linked by electron beam.

73. The membrane of claim 72, wherein the membrane is crossed linked by electron beam with a dose of from about 20 to150 kGy.

74. A filtration cartridge comprising:

a housing;

a pleated membrane positioned within the housing, wherein the membrane comprises:

a first microporous zone which is symmetric or asymmetric;

a second microporous zone which is symmetric or asymmetric; and

a third microporous zone which is asymmetric, wherein the third microporous zone is positioned between the first and second microporous zones with the first, second, and third microporous zones being integral with one another, wherein the first, second, and/or third microporous zones comprise a blend of a first polymer selected from the group consisting of PVDF, polyamides, polyimides, polyether sulphones, polysulphones, polyaryl sulphones, PVC, PET, polycarbonates, cellulose, regenerated cellulose, cellulose esters, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, and copolymers of acrylic or methacrylic polymers, and a second polymer wherein the second polymer is selected from one or more hydrophilic polymers from the group consisting of polyacrylic acid, polyvinylalcohol, polyvinylacetate, polyvinylpyrrolidone, polyethyleneglycol, polyvinylpyridine, polyethyleneimine, and polyoxazoline, wherein the membrane has a breaking strain of at least 20%, and has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi) or a throughput, when using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi); and wherein the housing contains greater than $0.11m^2$ of effective membrane area per inch of housing height.

75. The filtration cartridge of claim 23 wherein the housing contains greater than 0.11 m^2 of effective membrane area per inch of housing height.

76. A unsupported, microporous, high throughput filtration membrane with a breaking strain of at least 20%, and having a bubble point (in psi) of from about 15 to 50, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi), or a throughput, when using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi).

77. The membrane of claim 76, wherein the membrane is a multizone membrane.

78. The membrane of claim 77, wherein the membrane comprises three zones.

79. The membrane of claim 78, wherein the zones comprise:

a first microporous zone;

a second microporous zone; and

a third microporous zone, wherein the third microporous zone is positioned between the first and second microporous zones with the first, second, and third microporous zones being integral with one another.

80. The membrane of claim 79, wherein the first microporous zone is 5-140 μm thick, the second microporous zone is 10-140 μm thick, and the third microporous zone is 50-140 μm thick.

81. The membrane of claim 76, wherein the membrane has a total thickness of 65-300 μm.

82. The membrane of claim 76, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi).

83. The membrane of claim 82, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1188.5, where x is the bubble point (in psi).

84. The membrane of claim 83, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1288.5, where x is the bubble point (in psi).

85. The membrane of claim 76, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi).

86. The membrane of claim 85, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1469.4, where x is the bubble point (in psi).

87. The membrane of claim 86, wherein the membrane has a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1569.4, where x is the bubble point (in psi).

88. The membrane of claim 76, wherein the membrane has a breaking strain of at least 25%.

89. The membrane of claim 88, wherein the membrane has a breaking strain of at least 30%.

90. The membrane of claim 79, wherein the first, second, and third microporous zones comprise one or more polymers independently selected from the group consisting of PVDF, polyamides, polyimides, polyether sulphones, polysulphones, polyaryl sulphones, PVC, PET, polycarbonates, cellulose, regenerated cellulose, cellulose esters, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, and copolymers of acrylic or methacrylic polymers.

91. The membrane of claim 79, wherein the first, second, and/or third microporous zones are hydrophilic.

92. The membrane of claim 91, wherein the first, second, and/or third microporous zones comprise a hydrophilic polymer independently selected from the group consisting of polyacrylic acid, polyvinylalcohol, polyvinylacetate, polyvinylpyrrolidone, polyethyleneglycol, polyvinylpyridine, polyethyleneimine, and polyoxazoline.

93. The membrane according to claim 92, wherein the hydrophilic polymer comprises poly (2-ethyl-2-oxazoline).

94. The membrane according to claim 92, wherein the hydrophilic polymer is cross-linked.

95. The membrane according to claim 94, wherein the hydrophilic polymer is cross-linked by electron beam.

96. The membrane according to claim 95, wherein the hydrophilic polymer is cross-linked by electron beam with a dose of from about 20 to 150 kGy.

97. The membrane of claim 79, wherein the first, second, and/or third microporous zones independently comprise polyether sulfone, and poly (2-ethyl-2-oxazoline).

98. The membrane of claim 76, wherein the membrane is capable of being pleated without degradation of membrane retentive performance.

99. The membrane of claim 76, wherein the membrane is pleated.

100. The membrane of claim 76 further comprising:

a hydrophilic coating over the membrane.

WHAT IS CLAIMED:

1. A multizone, unsupported, microporous, high throughput filtration membrane having a bubble point (in psi) of from about 15 to 50 and a breaking strain of at least 20%, comprising:

a first microporous zone which is symmetric or asymmetric;

a second microporous zone which is symmetric or asymmetric; and

a third microporous zone which is asymmetric, wherein the third microporous zone is positioned between the first and second microporous zones with the first, second, and third microporous zones being integral with one another and wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi), or a throughput, when using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi).

2. A unsupported, microporous, high throughput filtration membrane with a breaking strain of at least 20%, and having a bubble point (in psi) of from about 15 to 50, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi), or a throughput, when using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi).

3. The membrane of claim 2, wherein the zones comprise:

a first microporous zone;

a second microporous zone; and

a third microporous zone, wherein the third microporous zone is positioned between the first and second microporous zones with the first, second, and third microporous zones being integral with one another.

4. The process of forming a multizoned, microporous, high throughput filtration membrane, with a breaking strain of at least 20%, comprising:

providing solutions of a polymer and a solvent for said polymer;

simultaneously or sequentially casting the solutions as 3 separate zones onto a support to form a multizone liquid sheet;

effecting a phase separation of the 3 separate zones of solutions; and

separating the multizone, microporous, high throughput filtration membrane from the support, wherein the membrane comprises:

a first microporous zone which is symmetric or asymmetric;

a second microporous zone which is symmetric or asymmetric; and

a third microporous zone which is asymmetric, wherein the third microporous zone is positioned between the first and second microporous zones with the first, second, and third microporous zones being integral with one another, and wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi) or a throughput, when using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi)

5. The membrane according to claim 1 or claim 3, or the process of claim 4, wherein the first microporous zone is 5-140 µm thick, the second microporous zone is 10-140 µm thick, and the third microporous zone is 50-140 µm thick.

6. The membrane according to claim 1 or claim 2, or the process of claim 4, wherein the membrane has a total thickness of 65-300 µm.

7. The membrane according to claim 1 or claim 2, or the process of claim 4, wherein the membrane has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1188.5, preferably greater than -11.65x + 1288.5 where x is the bubble point (in psi), or a throughput (in L/m^2), when measured using EMD Soy broth, which is greater than -20.23x + 1469.4, preferably greater than -20.23x + 1569.4 where x is the bubble point (in psi).

8. The membrane according to claim 1 or claim 2, or the process of claim 4, wherein the membrane has a breaking strain of at least 25%, preferably at least 30%.

9. The membrane according to claim 1 or claim 3, or the process of claim 4, wherein the first, second, and third microporous zones comprise one or more polymers independently selected from the group consisting of PVDF, polyamides, polyimides, polyether sulphones, polysulphones, polyaryl sulphones, PVC, PET, polycarbonates, cellulose, regenerated cellulose, cellulose esters, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, and copolymers of acrylic or methacrylic polymers.

10. The membrane according to claim 1 or claim 3, or the process of claim 4, wherein the first, second, and/or third microporous zones are hydrophilic.

11. The membrane of claim 10, or the process of claim 4, wherein the first, second, and/or third microporous zones comprise a hydrophilic polymer independently selected from the group consisting of polyacrylic acid, polyvinylalcohol, polyvinylacetate,

polyvinylpyrrolidone, polyethyleneglycol, polyvinylpyridine, polyethyleneimine, and polyoxazoline, preferably wherein the hydrophilic polymer comprises poly (2-ethyl-2-oxazoline).

12. The membrane of claim 1 or claim 3, or the process of claim 4, wherein the first, second, and/or third microporous zones independently comprise polyether sulfone, and poly (2-ethyl-2-oxazoline).

13. The membrane of claim 1 or 2, wherein the membrane is capable of being pleated without degradation of membrane retentive performance.

14. The membrane of claim 1 or claim 2, or the process of claim 4, wherein the membrane is pleated.

15. The membrane of claim 1 or claim 2 further comprising:
a hydrophilic coating over the membrane.

16. A multizone, unsupported, microporous, high throughput filtration membrane comprising:
a membrane having a first microporous zone which is symmetric or asymmetric;
a second microporous zone which is symmetric or asymmetric; and
a third microporous zone which is asymmetric, wherein the third microporous zone is positioned between the first and second microporous zones with the first, second, and third microporous zones being integral with one another and wherein the first, second, and/or third microporous zones comprise a blend of a first polymer selected from the group consisting of PVDF, polyamides, polyimides, polyether sulphones, polysulphones, polyaryl sulphones, PVC, PET, polycarbonates, cellulose, regenerated cellulose, cellulose esters, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, and copolymers of acrylic or methacrylic polymers, and a second polymer wherein the second polymer is selected from one or more hydrophilic polymers from the group consisting of polyacrylic acid, polyvinylalcohol, polyvinylacetate, polyvinylpyrrolidone, polyethyleneglycol, polyvinylpyridine, polyethyleneimine, and polyoxazoline and wherein the membrane has a breaking strain of at least 20%, and has a throughput (in L/m^2), when measured using whey broth, which is greater than $-11.65x + 1088.5$, where x is the bubble point (in psi), or a throughput, when using EMD Soy broth, which is greater than $-20.23x + 1369.4$, where x is the bubble point (in psi).

17. A filtration cartridge comprising:

a housing;

a pleated membrane positioned within the housing, wherein the membrane comprises:

a first microporous zone which is symmetric or asymmetric;

a second microporous zone which is symmetric or asymmetric; and

a third microporous zone which is asymmetric, wherein the third microporous zone is positioned between the first and second microporous zones with the first, second, and third microporous zones being integral with one another, wherein the first, second, and/or third microporous zones comprise a blend of a first polymer selected from the group consisting of PVDF, polyamides, polyimides, polyether sulphones, polysulphones, polyaryl sulphones, PVC, PET, polycarbonates, cellulose, regenerated cellulose, cellulose esters, polystyrenes, polyetherimides, acrylic polymers, methacrylic polymers, and copolymers of acrylic or methacrylic polymers, and a second polymer wherein the second polymer is selected from one or more hydrophilic polymers from the group consisting of polyacrylic acid, polyvinylalcohol, polyvinylacetate, polyvinylpyrrolidone, polyethyleneglycol, polyvinylpyridine, polyethyleneimine, and polyoxazoline, wherein the membrane has a breaking strain of at least 20%, and has a throughput (in L/m^2), when measured using whey broth, which is greater than -11.65x + 1088.5, where x is the bubble point (in psi) or a throughput, when using EMD Soy broth, which is greater than -20.23x + 1369.4, where x is the bubble point (in psi); and wherein the housing contains greater than $0.11m^2$ of effective membrane area per inch of housing height, preferably wherein the housing contains greater than 0.11 m^2 of effective membrane area per inch of housing height.

18. The membrane according to claim 11, the membrane of claim 16, or the process of claim 4, wherein the hydrophilic polymer is cross-linked, preferably wherein the hydrophilic polymer is cross-linked by electron beam, preferably wherein the hydrophilic polymer is cross-linked by electron beam with a dose of from about 20 to 150 kGy.

19. A filtration cartridge comprising:

a housing; and

the membrane of claim 1 positioned within the housing, preferably wherein the membrane is as defined in any one of claims 4, 6-14, when dependent on claim 1.

20. The membrane of claim 16, wherein the first polymer is PES and the second polymer is poly (2-ethyl-2-oxazoline).