~~Claims~~

~~What is claimed is:~~**CLAIMS**

1. An ophthalmic lens formed by a method comprising:
   determining a power profile based on a power profile function defined by a base optical power, an amount of spherical aberration at a radial distance from a geometric center of a lens, and a bump function;
   adjusting the power profile based at least on minimizing a shape metric comprising a through-focus flatness (TFF) metric of a through-focus curve; and
   forming the lens to exhibit the adjusted power profile.
2. The lens of claim 1, wherein forming a lens comprises configuring the geometric shape of the lens.
3. The lens of claim 1, wherein the spherical aberration, and parameters of the bump function are configured to vary by refractive prescription.
4. The lens of claim 1, wherein the spherical aberration, and parameters of the bump function are configured based on a characteristic of a target population.
5. The lens of claim 4, wherein the characteristic is at least one of a pupil size or a vergence variance.
6. The lens of claim 1, wherein the spherical aberration, and parameters of the bump function are configured based on pupil size and vergence variances for a specific prescription or target population.
7. The lens of claim 1, wherein forming a lens comprises configuring ~~the~~an internal gradient refractive index profile of the lens.
8. The lens of claim 1, wherein forming a lens comprises configuring ~~the~~a geometric shape of the lens and ~~the~~an internal gradient refractive index profile of the lens.
9. The lens of claim 1, wherein forming a lens comprises configuring a main body of the lens such that ~~the~~a light propagating through the lens is refracted to exhibit the adjusted power profile.
10. The lens of claim 1, wherein forming a lens further comprises configuring a main body of the lens such that at least an intensity of light propagating through the lens is changed to exhibit a target apodization profile.

11. The lens of claim 10, wherein the intensity of light propagating through the lens is changed by apodizing the lens.
12. The lens of claim 11, wherein the apodizing the lens is based on a transmittance profile defined by a continuous function, with a non-monotonically varying transmittance.
13. The lens of claim 12, wherein a maximum of transmittance is at a pupil center and a minimum value is positioned less than an optical zone (OZ) radius
14. The lens of claim 13, wherein the transmittance is based on a polynomial function.
15. The lens of claim 12, wherein a shape of the transmittance profile relative to a radial position on the lens is defined by a decrease from the center to a ~~midpoint~~middlepoint and then an increase to a peripheral point.
16. The lens of claim 1, wherein the ~~shape metric comprises a through-focus flatness (TFF) metric.~~

~~17. The lens of claim 16, wherein the~~ TFF is defined by $TFF = \int_{v_{t-\delta}}^{v_{t+\delta}} \left|\frac{df(v)}{dv}\right| dv$.

~~18.~~17. An ophthalmic lens comprising:

a main body configured to exhibit a power profile based on a power profile function defined by a base optical power, an amount of spherical aberration at a radial distance from a geometric center of a lens, and a bump function,

wherein the power profile is optimized based at least on minimizing a shape metric comprising a through-focus flatness (TFF) metric of a through-focus curve.

~~19.~~18. The lens of claim ~~18~~17, wherein the bump function comprises a multifocal function.

~~20.~~19. The lens of claim ~~18~~17, wherein the spherical aberration, and parameters of the bump function are configured to vary by refractive prescription.

~~21.~~20. The lens of claim ~~18~~17, wherein the spherical aberration, and parameters of the bump function are configured based on pupil size and vergence variances for a specific prescription or target population.

22.21. The lens of claim 1817, wherein the main body is configured by configuring thea geometric shape of the lens.

23.22. The lens of claim 1817, wherein the main body is configured by configuring thean internal gradient refractive index profile of the lens.

24.23. The lens of claim 1817, wherein the main body is configured by configuring thea geometric shape of the lens and thean internal gradient refractive index profile of the lens.

25.24. The lens of claim 1817, wherein the main body is configured such that thea light propagating through the lens is refracted to exhibit the power profile.

26.25. The lens of claim 1817, wherein the main body is configured such that at least an intensity of light propagating through the lens is changed to exhibit a target apodization profile.

27.26. The lens of claim 2625, wherein the intensity of light propagating through the lens is changed by apodizing the lens.

28.27. The lens of claim 2726, wherein the apodizing the lens is based on a transmittance profile defined by a continuous function, with a non-monotonically varying transmittance.

29.28. The lens of claim 2827, wherein a maximum of transmittance is at a pupil center and a minimum value is positioned less than an optical zone (OZ) radius.

30.29. The lens of claim 2928, wherein the transmittance is based on a polynomial function.

31.30. The lens of claim 2829, wherein a shape of the transmittance profile relative to a radial position on the lens is defined by a decrease from the center to a midpointmiddle point and then an increase to a peripheral point.

32.31. The lens of claim ~~18, wherein the shape metric comprises a through-focus flatness (TFF) metric.~~

33. ~~The lens of claim 32~~17, wherein the TFF is defined by $TFF = \int_{v_{t-\delta}}^{v_{t+\delta}} \left|\frac{df(v)}{dv}\right| dv$.

34.32. An ophthalmic lens comprising:

a main body configured to exhibit a power profile based on a power profile function defined by a base optical power, an amount of spherical aberration at a radial distance from a geometric center of a lens, and a bump function,

wherein the power profile provides vision correction and is further optimized to slow myopia progression or treat presbyopia based at least on minimizing a shape metric comprising a through-focus flatness (TFF) metric of a through-focus curve.

~~35.~~33. The lens of claim ~~34~~32, wherein the main body is configured by configuring ~~the~~a geometric shape of the lens.

~~36.~~34. The lens of claim ~~34~~32, wherein the spherical aberration, and parameters of the bump function are configured to vary by refractive prescription.

~~37.~~35. The lens of claim ~~34~~32, wherein the spherical aberration, and parameters of the bump function are configured based on pupil size and vergence variances for a specific prescription or target population.

~~38.~~36. The lens of claim ~~34~~32, wherein the main body is configured by configuring ~~the~~an internal gradient refractive index profile of the lens.

~~39.~~37. The lens of claim ~~34~~32, wherein the main body is configured by configuring ~~the~~a geometric shape of the lens and ~~the~~an internal gradient refractive index profile of the lens.

~~40.~~38. The lens of claim ~~34~~32, wherein the main body is configured such that ~~the~~a light propagating through the lens is refracted to exhibit the power profile.

~~41.~~39. The lens of claim ~~34~~32, wherein the main body is configured such that at least an intensity of light propagating through the lens is changed to exhibit a target apodization profile.

~~42.~~40. The lens of claim ~~41~~39, wherein the intensity of light propagating through the lens is changed by apodizing the lens.

~~43.~~41. The lens of claim ~~42~~40, wherein the apodizing the lens is based on a transmittance profile defined by a continuous function, with a non-monotonically varying transmittance.

44.42. The lens of claim 4341, wherein a maximum of transmittance is at a pupil center and a minimum value is positioned less than an optical zone (OZ) radius.

45.43. The lens of claim 4442, wherein the transmittance is based on a polynomial function.

The lens of claim 43, wherein a shape of the transmittance profile relative to a radial position on the lens is defined by a decrease from the center to a midpoint and then an increase to a peripheral point.

46. The lens of claim 34, wherein the shape metric comprises a through-focus flatness (TFF) metric.

47.44. The lens of claim 4732, wherein the TFF is defined by $TFF = \int_{v_{t-\delta}}^{v_{t+\delta}} \left|\frac{df(v)}{dv}\right| dv$.

48.45. A method of forming an ophthalmic lens, the method comprising:

determining a power profile based on a power profile function defined by a base optical power, an amount of spherical aberration at a radial distance from a geometric center of a lens, and a bump function;

adjusting the power profile based at least on minimizing a shape metric comprising a through-focus flatness (TFF) metric of a through-focus curve; and

forming a lens to exhibit the adjusted power profile.

49.46. The method of claim 4845, wherein forming a lens comprises configuring thea geometric shape of the lens.

50.47. The method of claim 4845, wherein the spherical aberration, and parameters of the bump function are configured to vary by refractive prescription.

51.48. The method of claim 4845, wherein the spherical aberration, and parameters of the bump function are configured based on pupil size and vergence variances for a specific prescription or target population.

52.49. The method of claim 4845, wherein forming a lens comprises configuring the internal gradient refractive index profile of the lens.

53.50. The method of claim 4845, wherein forming a lens comprises configuring thea geometric shape of the lens and thean internal gradient refractive index profile of the lens.

54.51. The method of claim 4845, wherein forming a lens comprises configuring a main body of the lens such that the light propagating through the lens is refracted to exhibit the adjusted power profile.

55.52. The method of claim 4845, wherein forming a lens comprises configuring a main body of the lens such that at least an intensity of light propagating through the lens is changed to exhibit a target apodization profile.

56.53. The method of claim 5552, wherein the intensity of light propagating through the lens is changed by apodizing the lens.

57.54. The method of claim 5653, wherein the apodizing the lens is based on a transmittance profile defined by a continuous function, with a non-monotonically varying transmittance.

58.55. The method of claim 5754, wherein a maximum of transmittance is at a pupil center and a minimum value is positioned less than optical zone (OZ) radius

59.56. The method of claim 5844, wherein the transmittance is based on a polynomial function.

57. The method of claim 54, wherein a shape of the transmittance profile relative to a radial position on the lens is defined by a decrease from the center to a middle point and then an increase to a peripheral point.

58. The method of claim 45, wherein the TFF metric is defined by $TFF = \int_{v_{t-\delta}}^{v_{t+\delta}} \left|\frac{df(v)}{dv}\right| dv$.

60. 59. The method of claim 57The lens of claim 41, wherein a shape of the transmittance profile relative to a radial position on the lens is defined by a decrease from the center to a midpointmiddle point and then an increase to a peripheral point.

61.The method of claim 48, wherein the shape metric comprises a through-focus flatness (TFF) metric.

62. The method of claim 61, wherein the TFF metric is defined by $TFF = \int_{v_{t-\delta}}^{v_{t+\delta}} \left|\frac{df(v)}{dv}\right| dv$.