

Claims

1. A multifocal ophthalmic lens, wherein:
a first surface of the lens is shaped to form a first surface power map;
a second surface of the lens is shaped to form a second surface power map;
5 the first and second surface power maps together form a lens power map;
the first surface power map, the second surface power map, or the lens power map
comprises a spiral, the spiral having a variation across at least a portion of the lens.
2. A multifocal ophthalmic lens according to claim 1, wherein the spiral has a first
10 periodic component, in a radial direction extending outwards from the centre of the portion,
and a second periodic component, in an azimuthal direction about the centre of the portion.
3. A multifocal ophthalmic lens according to claim 2, wherein:
the first periodic component has a period of greater than 100 microns; and
15 the second periodic component has a period of greater than 6 degrees.
4. A multifocal ophthalmic lens according to any preceding claim, wherein the
variation of the spiral comprises an offset in power, the offset changing according to a
radial distance from the centre of the portion.
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5. A multifocal ophthalmic lens according to any preceding claim, wherein a peak
power of one or more arms of the spiral varies according to one or both of: a radial distance
from the centre of the portion and an azimuthal position about the centre of the portion.
- 25 6. A multifocal ophthalmic lens according to any preceding claim, wherein:
a peak power of each arm of the spiral does not vary with radial distance from the
centre of the portion; and
the peak power of at least one arm of the spiral differs from that of the other arms.

7. A multifocal ophthalmic lens according to any preceding claim, wherein each of the first surface power map and the second surface power map vary smoothly across the portion.

5 8. A multifocal ophthalmic lens according to any preceding claim, wherein:
the portion of the lens comprises a central region and an outer region, the outer region surrounding the central region;
the lens power map within the outer region comprises the spiral; and
the lens power map does not vary periodically within the central region.

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9. A multifocal ophthalmic lens according to claim 8, wherein the central region has a diameter of less than 50% of that of the portion.

10. A multifocal ophthalmic lens according to claims 8 or 9, wherein:
15 the lens comprises a transition region, the transition region surrounding the central region and the outer region surrounding the transition region; and
the lens power map varies such that the transition region provides a smooth transition between the central zone and the outer zone.

20 11. A multifocal ophthalmic lens according to any preceding claim, wherein a twist rate of the spiral varies according to a radial distance from the centre of the portion.

12. A multifocal ophthalmic lens according to any preceding claim, wherein a width of one or more arms of the spiral differs from a corresponding width of the other arms of the
25 spiral.

13. A multifocal ophthalmic lens according to claim 12, wherein, at a pre-determined radial distance from the centre of the portion, the spiral changes its direction of rotation.

30 14. A multifocal ophthalmic lens according to any preceding claim, wherein the ophthalmic lens is a contact lens, a spectacle lens, or an intraocular lens.

15. A method of manufacturing a multifocal ophthalmic lens, the method comprising:
operating a lathe to shape a first surface of one of: a lens, a mould for a lens, or an
insert for manufacturing a mould for a lens to form a first surface power map;
5 operating a lathe to shape a second surface of the lens, mould, or insert to form a
second surface power map;
wherein:
the combination of the first and second surface power maps forms a lens power
map;
10 the first surface power map, the second surface power map, or the lens power map
comprises a spiral, the spiral having a variation across at least a portion of the lens, mould
or insert.
16. A method of improving vision of a person, the method comprising:
15 providing a multifocal ophthalmic lens according to any of claims 1 to 14 to a
person in need of improved vision.
17. A multifocal ophthalmic lens according to any one of claims 1 to 14, in which the
ophthalmic lens is a centre distance contact lens, or a centre near contact lens.
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18. A multifocal ophthalmic lens according to any one of claims 8 to 10, wherein the
central region has an optical power corresponding to a distance vision correction.
19. A multifocal ophthalmic lens according to any one of claims 8 to 10, wherein the
25 central region has an optical power corresponding to a near vision correction.