

Claims

1. A multifocal ophthalmic lens wherein:
a first surface of the lens varies across at least a portion of the lens to form a first surface power map;
5 the first surface power map comprises a spiral, with a power that varies substantially periodically both radially outwards from and angularly about an optical axis of the lens;
a period of the radial variation is greater than 100 microns; and
a period of the angular variation is greater than 6 degrees.
- 10 2. A multifocal ophthalmic lens according to claim 1, wherein:
the ophthalmic lens is a contact lens; and
the first surface varies across an optic zone of the contact lens to form the first surface power map.
- 15 3. A multifocal ophthalmic lens according to claims 1 or 2, wherein the power varies smoothly across the portion.
4. A multifocal ophthalmic lens according to claim 3, wherein the power varies both radially and angularly as one of: a rounded square wave and a sinusoid.
- 20 5. A multifocal ophthalmic lens according to claims 1 or 2, wherein the power varies both radially and angularly as a square wave.
6. A multifocal ophthalmic lens according to any preceding claim, wherein the periods
25 of the radial and angular variations are each substantially constant across the portion.
7. A multifocal ophthalmic lens according to any of claims 1 to 5, wherein the period
of at least one of the radial and angular variations changes according to one or both of: a radial distance from the optical axis of the lens and an angular position about the optical
30 axis of the lens.

8. A multifocal ophthalmic lens according to any preceding claim, wherein:
the lens comprises a central region and an outer region, the central region immediately surrounding the optical axis of the lens and the outer region surrounding the central region;
- 5 the power of the central region does not vary periodically across the central region;
and
the outer region comprises the angular and radial variations in power.
9. A multifocal ophthalmic lens according to claim 8, wherein the central region has
10 a diameter of less than 50% of that of the portion.
10. A multifocal ophthalmic lens according to claims 8 or 9, wherein:
the lens comprises a transition region, the transition region surrounding the central region and the outer region surrounding the transition region; and
- 15 the power of the transition region varies to provide a smooth transition between the central and outer regions.
11. A multifocal ophthalmic lens according to any preceding claim, wherein:
the lens comprises a second surface which varies across the portion of the lens to
20 form a second surface power map;
the second surface power map comprises a spiral, with a power that varies substantially periodically radially outwards from and angularly about the optical axis of the lens;
a period of the radial variation of the second surface power map is greater than 100
25 microns; and
a period of the angular variation of the second surface power map is greater than 6 degrees.
12. A multifocal ophthalmic lens according to claim 11, wherein:
30 the first surface power map and the second surface power map each comprise a spiral; and

the spirals provided by the first and second surface power maps twist in opposing directions.

13. A multifocal ophthalmic lens according to any preceding claim, wherein the
5 multifocal ophthalmic lens is a myopia control lens.

14. A method of manufacturing a multifocal ophthalmic lens, the method comprising:
operating a lathe to shape a first surface of at least one of: a lens, a mould for a lens,
or an insert for manufacturing a mould for a lens, such that:
10 the first surface varies across at least a portion of the lens to form a first surface
power map;
the first surface power map comprises a spiral;
the first surface power map varies substantially periodically both radially outwards
from and angularly about an optical axis of the lens;
15 a period of the radial variation is greater than 100 microns; and
a period of the angular variation is greater than 6 degrees.

15. A method according to claim 14, further comprising operating a lathe to shape a
second surface of the lens, the mould, or the insert, such that:
20 the second surface varies across the portion of the lens to form a second surface
power map;
the second surface power map comprises a spiral;
the second surface power map varies substantially periodically both radially
outwards from and angularly about an optical axis of the lens;
25 a period of the radial variation is greater than 100 microns; and
a period of the angular variation is greater than 6 degrees.

16. A method of improving vision of a person, the method comprising:
providing a multifocal ophthalmic lens according to any of claims 1 to 13 to a
30 person in need of improved vision.