



Keratoconic Contact Lens Fitting and the Capricornia Keratoconus Design

Key Features

- Automatic change in design with increasing keratoconus to maintain optimum fit
- Bi-toric and toric periphery options
- Known and variable peripheral curves
- Manufactured on advanced CNC automatic lathes
- Available in all major materials
- 14-lens trial set for loan or purchase
- Full technical support
- Comprehensive Per Case warranty
- Part of an extensive portfolio of keratoconus designs

Fitting Guide

The Capricornia Keratoconus lens was developed in Australia and provides an excellent starting point for many patients where a smaller diameter is required. The KBA and Epicon LC designs employ larger diameter philosophies and, taken together, these designs provide a complementary portfolio of keratoconus contact lens options. When fitting RGP lenses to a patient with keratoconus, the following parameters must be specified:

Back Optic Zone Radius or Base Curve (BOZR)

Generally we seek to obtain a central fluorescein pattern showing slight apical clearance or feather touch. There should also be mid peripheral contact. The idea is to distribute the weight of the lens onto the more normal peripheral cornea.

The initial choice of BOZR is based on K readings and best spectacle VA. Some practitioners start with a BOZR that produces obvious central touch then progressively steepen the fit until the first BOZR giving apical clearance is observed.

With regard to K readings, it is best to choose a BOZR approximately half-way between steepest and flattest K. If K readings are off the scale, you will most likely need a BOZR of less than 6.80mm.

With regard to spectacle VA, the best VA will give us an indication as to the degree of progression of the condition and hence the required BOZR.

Best spectacle VA	BOZR required
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6/6 – 6/7.5	7.20 – 7.80
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6/9.5 – 6/12	6.60 – 7.10
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< 6/12	< 6.60
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Initially, work in big steps (perhaps 0.2mm). Err on the steep side for your final order. Avoid toric BOZR as they do not increase the area of alignment and they may decrease VA due to the toric BOZR “spinning” on the cone.

Total Diameter (TD)

The average lens diameter for a conventional RGP lens fitted to a keratoconic eye is about 8.50 – 9.00mm.

Back Optic Zone Diameter (BOZD)

Should be as small as possible to allow adequate tear exchange around the cone, however not so small as to cause flare. As keratoconus increases, BOZD must decrease. A rough approximation is that BOZD should equal BOZR although this does not hold as well in cases of very early and very advanced keratoconus. As a general guide:

BOZR	BOZD
7.20 – 7.80	7.00 – 7.40
6.50 – 7.10	6.50 – 6.90
< 6.50	5.80 – 6.40

Peripheral Curve Radii (PCR)

The aim is to achieve an even band of clearance (approximately 1mm in width) around the edge of the lens. The peripheral cornea is relatively normal, however a greater degree of flattening is required compared to a non-keratoconic eye due to the steeper BOZR utilised to fit over the cone. The greater the degree of flattening required (i.e. the steeper the BOZR), the greater the number of peripheral curves one should use to improve the blend. Edge clearance is best modified by adjusting PCR and BOZD, and not

BOZR. The BOZR should only be altered if you wish to change the central fit of the lens.

Toric PCR should be utilised in approximately 10-15% of cases. Often there will be significant with-the-rule astigmatism in the peripheral cornea, such that the edge clearance at 6 and 12 will be greater than at 3 and 9 (with inferior lift-off often being noted). This problem is easily solved by the use of toric PCR. Anywhere between 2.00-5.00D of toricity may be incorporated into the PCR and no difficult calculations are required nor is any form of lens stabilisation needed (see example below).

Back Vertex Power (BVP)

As BOZR reduces, BVP (minus) must increase. Hence BVP must be determined by refracting over a trial lens with appropriate BOZR. Always over-minus by 0.50D when specifying BVP. If residual cylinder is present, monitor it as it may change from one aftercare to the next. If it persists and it is relatively constant, the best option is to prescribe spectacles for use over the top of the contact lenses.

The table below outlines the BOZD, PCR and BVP usually associated with different degrees of advancement of keratoconus. In other words, it gives an idea as to what the BOZD, PCR and BVP are required for keratoconic lenses of different BOZR. The table assumes a lens diameter of 8.60mm for BOZR less than 7.00mm and a lens diameter of 9.00mm for BOZR greater than or equal to 7.00mm. Note that this table is only meant as a general guide as there will be significant variation between patients.

BOZR	TD	BOZD	PCR	BVP
7.80	9.00	7.20	8.40(0.5)/9.00(0.4)	-1.00
7.60	9.00	7.20	8.30(0.5)/8.90(0.4)	-2.00
7.40	9.00	7.00	8.30(0.5)/8.90(0.5)	-3.00
7.20	9.00	7.00	8.10(0.5)/8.70(0.5)	-4.00
7.00	9.00	6.80	7.90(0.4)/8.50(0.4)/9.50(0.3)	-5.00
6.80	8.60	6.80	7.80(0.3)/8.60(0.3)/9.30(0.3)	-6.00
6.60	8.60	6.60	7.80(0.4)/8.60(0.3)/9.60(0.3)	-8.00
6.40	8.60	6.40	7.60(0.4)/8.60(0.4)/9.90(0.3)	-10.00
6.20	8.60	6.20	7.70(0.4)/8.70(0.4)/10.20(0.4)	-12.00
6.00	8.60	6.20	7.50(0.4)/9.00(0.4)/11.00(0.4)	-14.00
5.80	8.60	6.00	7.30(0.4)/8.80(0.3)/10.30(0.3)/11.80(0.3)	-16.00
5.60	8.60	6.00	7.40(0.4)/9.10(0.3)/10.10(0.3)/11.60(0.3)	-18.00
5.40	8.60	5.80	7.40(0.4)/8.90(0.4)/10.40(0.3)/11.40(0.3)	-20.00
5.20	8.60	5.80	7.20(0.4)/8.70(0.4)/10.20(0.3)/11.20(0.3)	-22.00

Essentially, the design we are aiming to achieve with these parameters is that of a 'modified' conoid lens

Toric PCR Example

BOZR	TD	BOZD	PCR	BVP
6.80	8.60	6.80	8.50/8.00(0.3)/9.00/8.50(0.3)/10.00/9.50(0.3)	-6.00

Note the same degree of toricity for each peripheral curve (0.5mm).

Further assistance

Our technical advisers are experienced in all aspects of contact lens design and fitting. Feel free to consult with them about any fitting issue.



**CAPRICORNIA
CONTACT LENS**