



Lens file: Rose K2 NC

Continuing our series on specialist contact lenses, Neil Cox describes the Rose K2 nipple cone for keratoconic fitting

Since its introduction to the UK market in 1997,¹ the Rose K lens system has become one of the world's most popularly prescribed contact lens designs for keratoconus.

Although the lens provides a wide range of parameters, there are some keratoconic eyes where insufficient edge lift is available using the current Rose K fitting system. Typically these eyes have a very pronounced nipple-shaped cone which is small and usually relatively central (Figure 1).

The Rose K2 NC (nipple cone) has been developed to complement the current range and in particular to address these cases. The lens is available in the UK from David Thomas Contact Lenses, as part of the Rose K system, and in a full range of materials.

Applications

The Rose K2 NC has been specifically designed for keratoconic eyes with a pronounced nipple-shaped cone. Although the lens is more likely to be used in moderate to severe cases, it can be used for any stage of nipple cone. It will not give good results for larger oval-shaped cones, pellucid marginal degeneration or keratoglobus.

Technical features

The design and parameters of the Rose K2 NC are summarised in Table 1. The lens is available with BOZR 7.70mm to

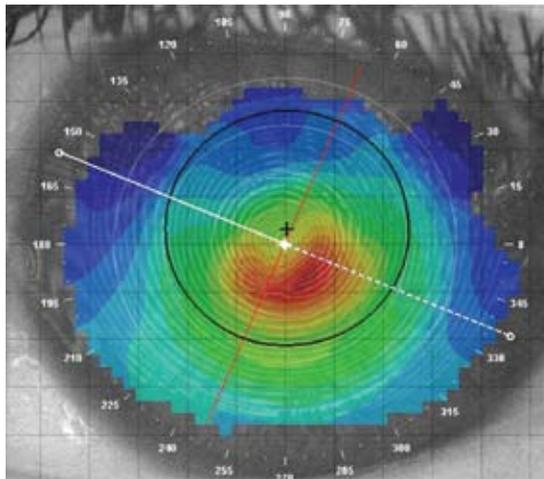


Figure 1 Topography plot of small nipple cone just below the pupil centre. Note rapid flattening of corneal curvature from the cone apex

TABLE 1 Technical features

Materials, manufacture and use	Design and parameters
Available in any material	BOZR 7.70 – 4.30mm
Daily wear	TD Standard 8.30mm
	TD available 7.60 – 9mm
	EL available 1.5 decreased – 3.0 increased, 0.1 steps
	BVP ±40.00D

4.30mm. The standard total diameter (TD) is 8.30mm with an available range of 7.60mm to 9.00mm. It has a small aspheric back optic which decreases in diameter as the base curve steepens. The aberration-controlled front optic is larger than the back optic, which

effectively increases the available optic area.

The lens is available with edge lift (EL) defined in 0.1 steps from -1.5 decreased to +3.0 increased. There is accelerated flattening of the peripheral curves outside the back optic to generate the increased edge lift, compared to the current Rose K2 design, and this increases as the BOZR steepens.

The smaller optic zone and accelerated flattening can be seen in Figures 2 and 3, comparing the original Rose K2 with the Rose K2 NC on the same eye. The trial set comprises 24 lenses from BOZR 7.40mm to 4.60mm. The trial set lens diameters range from 8.90mm on the flatter BOZR to 8.10mm on the steeper BOZR. The power of the trial lens gets progressively more minus as the BOZR steepens to approximate the final lens power.

Fitting procedure

As with the Rose K2 fitting system, a step-by-step approach to fitting is recommended:

- In mild to moderate cases (mean K flatter than 6.00mm) the first trial lens should be 0.20mm steeper than mean K. In advanced cases (mean K 5.10mm

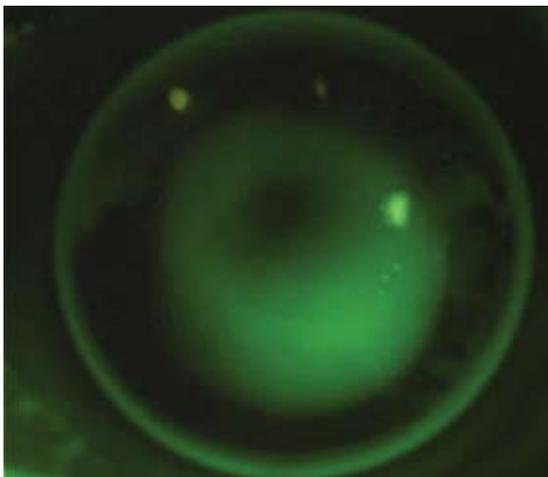


Figure 2 Rose K2 6.40/ 8.70 increased edge lift

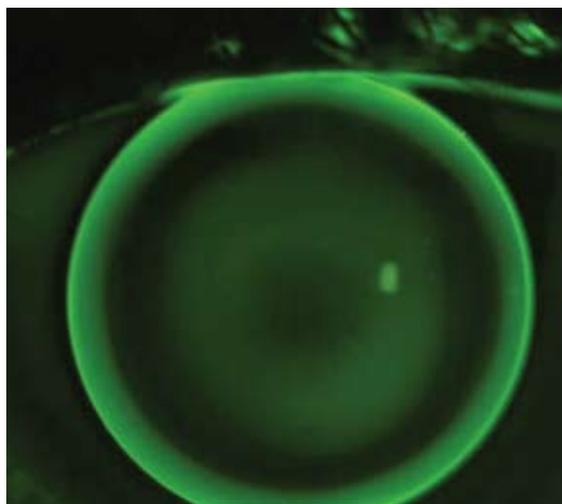


Figure 3 Rose K2 NC 6.40/ 8.30 K2 NC standard edge lift



FITTING TIPS

- Select this lens for nipple cone
- Base trial lens selection on mean K, as follows:
 - Flatter than 6.00mm, select 0.2mm steeper than mean K
 - 5.10mm to 6.00mm, select on mean K
 - Steeper than 5.00mm, select 0.50mm flatter than mean K
- Aim for light apical touch
- Ensure adequate peripheral edge clearance. Observe 0.5- 0.7mm wide fluorescein band
- Achieve an interpalpebral fit with capillary lid attachment
- Adjust BOZR, TD and EL to achieve good centration and 1.00mm movement on blink

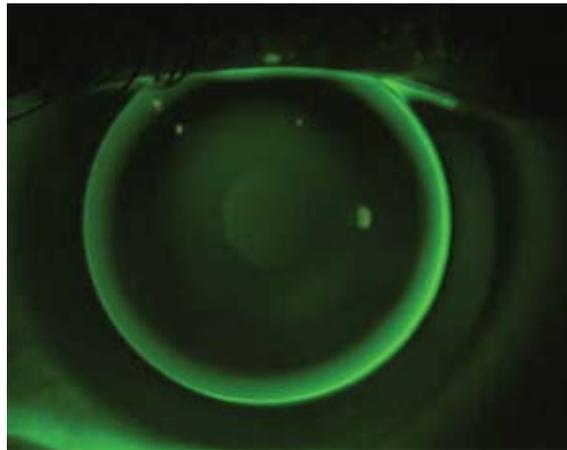


Figure 4
Optimal fit for Rose K2 NC. Light apical touch, 0.50-0.70mm peripheral fluorescein band width, well centred with capillary lid attachment

to 6.00mm) the trial lens suggested is equivalent to mean K, and in severe cases (mean K steeper than 5.00mm) 0.50mm flatter than mean K. With a topographer use the 3.00mm sim Ks

- The peripheral fit is assessed along the horizontal meridian, when the lens is centred. The peripheral fluorescein band should be 0.5mm to 0.7mm wide, indicating ideal edge clearance. Use different edge lift values to achieve this edge clearance

- The optimal total diameter will achieve an interpalpebral fit with capillary lid attachment. The standard TD is 8.30mm. It is likely that a larger TD will be required for flatter keratoconics and smaller TD for advanced cases, from the available range of 7.60mm to 9.00mm. This variation in diameter is reflected in the trial set

- Next assess lens location which should give good pupil coverage. A low riding lens may be encouraged to ride up by flattening the BOZD, increasing the EL and/or increasing TD. Conversely, better centration of a high riding lens may be achieved by making the opposite changes

- Optimal movement should be about 1mm on blink to ensure good tear exchange beneath the lens. Lens

movement is increased or decreased with commensurate alterations to EL.

Clinical performance

The pre-launch evaluation of Rose K2 NC was reported at the Global Speciality Lens Symposium² earlier this year. Thirteen experienced keratoconic fitters from around the world fitted 120 eyes and returned 113 case reports. The average number of lenses ordered to achieve the final fit was 1.3 per eye, yielding an 86 per cent first-fit success rate and 85 per cent of cases were reported as successful.

Eighteen cases were unsuccessful, comprising: four cases exhibiting cone morphology other than nipple, four cases requiring alternative lens types, five cases with surface wetting related problems, one case requiring excessive EL outside the current range, one case preferring vision with an existing Rose K2 lens, two cases with reduced comfort compared to existing lens and one case proceeding to surgery.

For existing lens wearers, 59 per cent of cases reported better vision and 33 per cent the same. In mild to moderate cases (mean K flatter than 6.00mm) the final prescription lens approximated to 0.2mm steeper than mean K. In

advanced cases (mean K 5.10mm to 6.00mm) the lens was fitted on mean K and in severe cases (mean K steeper than 5.00mm) the lens was fitted 0.50mm flatter than mean K.

Because of the small TD and BOZD, which closely follows the contour of the nipple cone, there appears to be little or no requirement for toric or quadrant-specific options. Investigators commented very positively on 'ease of fitting'.

Conclusions

The Rose K2 NC has been developed to complement the Rose K2 lens fitting system. It is specific to nipple cone morphology. The fitting procedure is straightforward and, with experience, gives approximately 86 per cent first-fit success. ●

References

- 1 Cox ND. A new system for keratoconic fitting. *Optician*, 1997; 5630:214 28-30.
- 2 Rose P. Presentation at Global Speciality Lens Symposium, Las Vegas, January 2011.

- Neil Cox is senior optometrist at Moorfields and King's College Hospitals, London. He is also engaged in private contact lens practice in central London