OrthoTool User Guide

A. What to look for in the beginning

1. Age: related to corneal biomechanics and amount of target
2. Ethnicity: related to corneal rigidity
3. K readings: flat, medium or steep
    a. To determine diameter of lens, e.g. flat K use slightly larger diameter
    b. Corneal asphericity (shape factor): spherical or toric
4. Rx (including astigmatism); low, medium or high in order to estimate forces required. This is related to Reverse Curve (RC) width
5. HVID/VVID: to determine proper diameter of lens
6. Corneal eccentricity (shape factor): proper choice of alignment curve radii (AC) for centering
7. Central Corneal Thickness (CCT): to determine the corneal rigidity for proper forces applied
8. Pupil size: to construct the Optical Zone Diameter (OZD)

B. Choose the design: Basic (empirical) or Advanced

C. Enter information

1. Patient Rx:
    a. K reading
    b. Rx; sphere & astigmatism

D. Preference: lens construction

1. Diameter of lens: Based on HVID/VVID, e values, K reading: can be verified with trial lenses or Medmont topographer with OrthoTool software
2. Base optical zone diameter (OZD): based on pupil diameter in room and dim illuminations. Keep the desired width in mind & finalize after settling other curves' diameter to match (adjust width of AC, RZ: reverse & relief curves & peripheral curve. Mostly based on the total widths of AC1 & AC2.
3. Base Optic Zone eccentricity (base asphericity): follow guidelines. General default value: Aspheric 1.4 for 5.4 mm BOZD. Adjust value of asphericity based on OZ diameter. Minor alteration to satisfy the SAG philosophy.
4. Apical tear film thickness (TLT): Start with 5 microns (0.005) and increase with higher amount of Rx (targeting). Normally from 5 to 7 microns. Check software TLT diagram to confirm fluid balance under the lens (balance between apex & junction of relief and alignment curves).
5. Reverse curve width (RC width): Most powerful area for effectiveness and myopia control. This width determines the volume of cell fluid to move in.
    a. Higher targeting requires a wider width and vice versa.

b. Flatter K reading (<41.50 D) requires a smaller width to help to generate a stronger force.
c. Steep K reading (>44.00 D) requires a wider width to avoid this curve radius to be too steep causing lens binding/adhesion.
d. Adjust width by 0.10 mm.
e. Initially may use a wider width for fluid movement, and after treatment stabilization, a smaller width can be used to enhance results with a steeper RED zone.

6. Reverse curve TLT: Standard volume of 20 microns (0.02). This serves to reduce or enhance force applied. Normal range is from 15 to 25 microns (0.015 to 0.025). This also serves to regulate SAG position of the lens on the cornea.
7. Relief curve width (Relief 1 width): Standard 0.3 mm. Can go up to 0.4 mm for more relief in case of decentration and low riding.
8. Relief curve TLT: Standard value of 4.5 microns (0.0045). The range is from 3.5 to 6 microns. This serves to have further relief or enhancement of forces at the RC. Since it is connected with AC1, the increase in tear volume at this curve (increase in TLT) together with the TLT at AC, will facilitate the actions of small capillary, surface tension & squeeze film forces. Its connection with alignment curve 1 further enhances the continuity of fluid dynamic under the lens.
9. Alignment Zone (AC1 + AC2): Serves to align the lens on the corneal surface for centration. It also serves to move cell fluid from the outside to the mid periphery of the cornea. Other functions:
    - Adjust width to match desired OZD
    - To create a tighter fit, make AC1 width larger than AC2 (0.9/0.6 mm)
    - To create a flatter fit, make AC1 shorter than AC2 (0.7/1.0 mm)
10. Peripheral curve width (PC): standard 3.0 mm. Required to create a water-seal environment for effective action in the center of the lens.
11. Peripheral curve TLT: Standard value 60 microns (0.06). Tear volume controls the tightness of the fit for desired centration. This volume can be adjusted based on the RC TLT, usually 50% of the volume or can be lower or higher.

E. Fine tuning for proper lens fit

1. Adjust proper alignment curve: go to patient Rx column and adjust the corneal eccentricity to match the desired AC1 radius (this number can be determined by using trial method or straight from topographer's corneal e values).
2. Changes in RC radius: for the purpose of increasing & decreasing mid peripheral steepness or flatness for effective results. This can be accomplished by:
    a. Increase or decrease in power targeting (based on revised Jessen Factor, and the results from over refraction with lens on and without.
    b. Adjust base eccentricity within normal range (norm asp 1.4 with 5.4 mm OZD)

c. Adjustment of RC TLT (preference page): by increasing the volume (e.g. from 0.20 to 0.23 microns), the RC radius will be flattened (e.g. from 6.18 to 6.23) and vice versa. However, at the same time, the relief curve radius will also change from 7.52 to 7.41 for the purpose of fluid balance. The difference between RC and Relief Curve radii reflects steepness/flatness of this zone for forces applied. Extra relief will cause ineffectiveness of design. Should maintain the ratio of RC/Relief C radii from 1.0 to 1.4 mm. Learn to view the tear film diagram (with numeric representation) for the best fluid dynamic and balance.

Example: with all other parameters the same		
Reverse Curve TLT	0.020 µm	0.023 µm
Reverse Curve Radius (0.6 mm)	6.18 mm	6.22 mm
Relief Curve Radius (width 0.3 mm)	7.52 mm	7.41 mm
Relief Curve TLT	.0045 µm	.0045 µm

d. Peripheral Curve: the tear volume at this zone should be around 50% of the tear volume at the reverse curve. Adjust accordingly depending on the fit of lens.