

# Wavefront guided optics



## CS Lens Design

*The simple solution for designing and manufacturing custom contact lenses*

A new chance with scleral lenses

PRESCRIBED POWER		CONVERTED POWER (DRY)	FRONT VERTEX POWER DRY	FRONT VERTEX POWER WET	Front radii of curvature (dry) mm	Front radii of curvature (wet) mm
Sphere	+3.00	5	5	3	6.07	8.07
Cylinder	-2.50	-4.125	-4.125	-2.5	6.37	8.48
Axis	90					

Aspheric optical zone	<input type="checkbox"/> e	<input type="checkbox"/> k	<input type="checkbox"/> High Definition
Lens type	DSS		
<input checked="" type="checkbox"/> Dry	Base curve (mm)	6.4	8.51 Wet
<input type="checkbox"/> Wet	Center thickness	.1	0.13 Wet
<input checked="" type="checkbox"/> Dry	Edge thickness	06	0.08 Wet
<input type="checkbox"/> Wet	Edge lift	0	0 Wet
<input checked="" type="checkbox"/> Dry	Anterior optical zone	8	6.02 Dry
<input type="checkbox"/> Wet	Posterior optical zone	10	7.52 Dry
<input checked="" type="checkbox"/> Dry	Lens diameter (mm)	14.2	10.68 Dry
<input type="checkbox"/> Wet	Index of refraction dry	1.510	
	Index of refraction wet	1.410	
	Linear expansion	1.33	
	Radial expansion	1.33	

Add	2.00
add zone diameter	2.5
Add transition zone diameter	4.0
Add vertical offset	-1
Add horizontal offset	0
Pupil diameter (mm)	6

**DE-HYDRATED LENS THICKNESS none CSLensDesign**

CT(dry) = 0.14 Rot = 0 dx = 0 dy = 0

**BALLAST**

Full prism  
 Double slab  
 Ballast bumps

Slab height: .5  
 Transition edge width: 3  
 Doubleslab center below lens center: 0

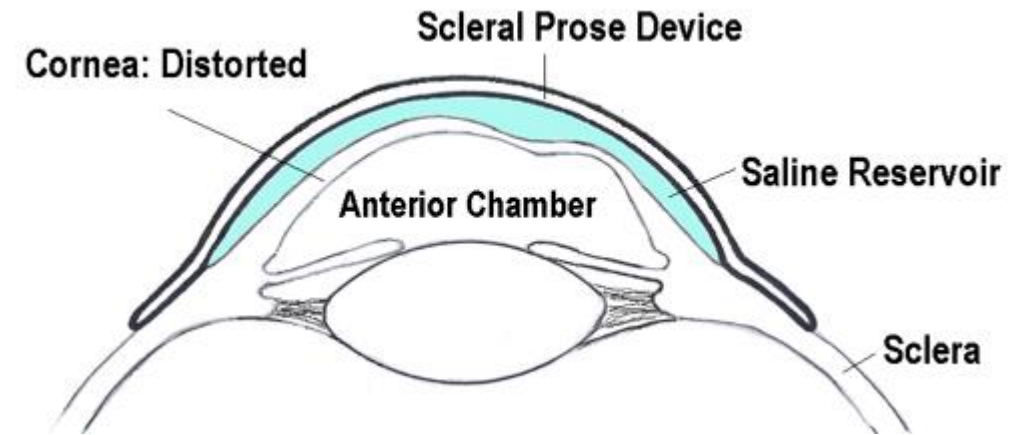
**DESIGN LENS**

Lens name: Tonic Multifocal Double Slab  
 Load external file  
 WF correction  
 Smooth surface  
 DAC  
 Optform



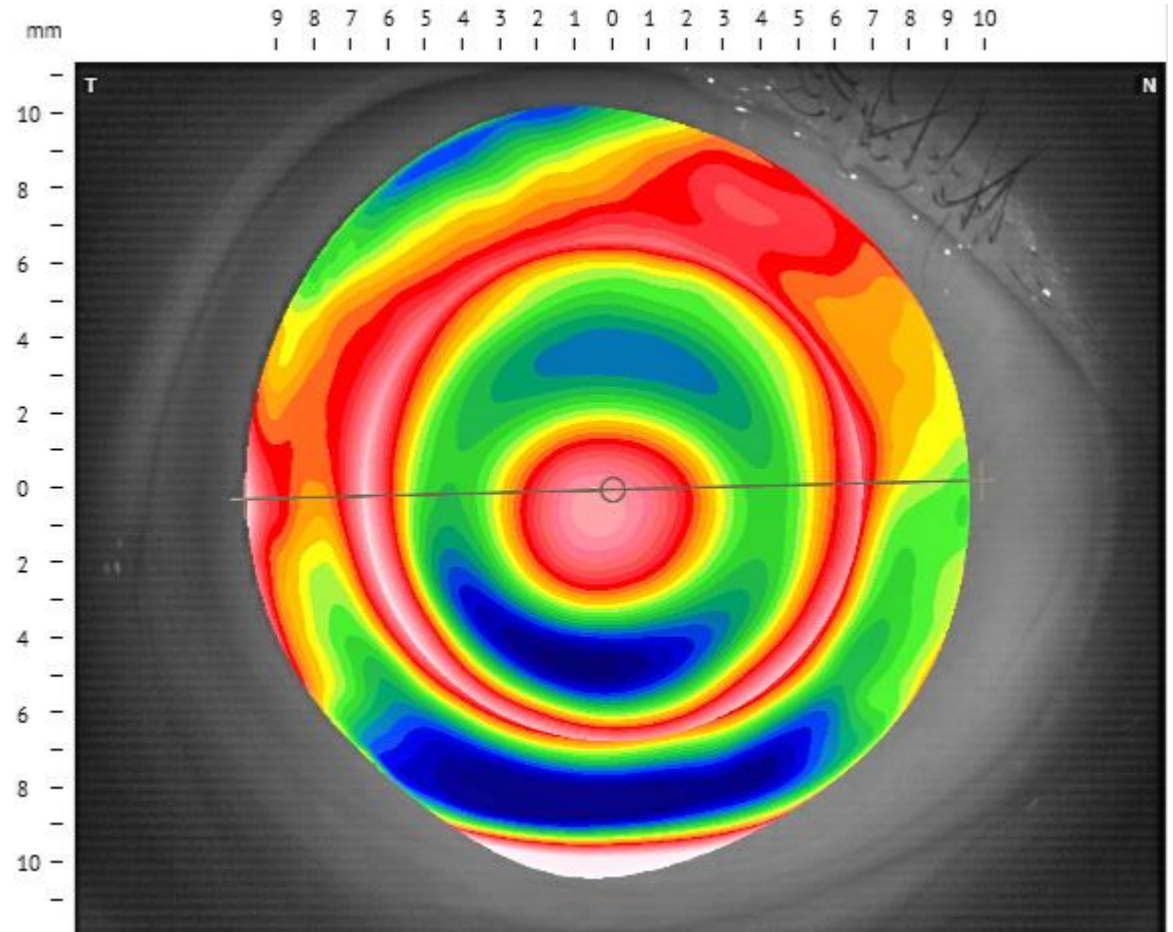
# Surfaces

- **Front surface of the lens**
- **Back surface of the lens**
- Front surface of the cornea
- Back surface of the cornea
- Front surface of the IOL
- Back surface of the IOL



# Back surface design

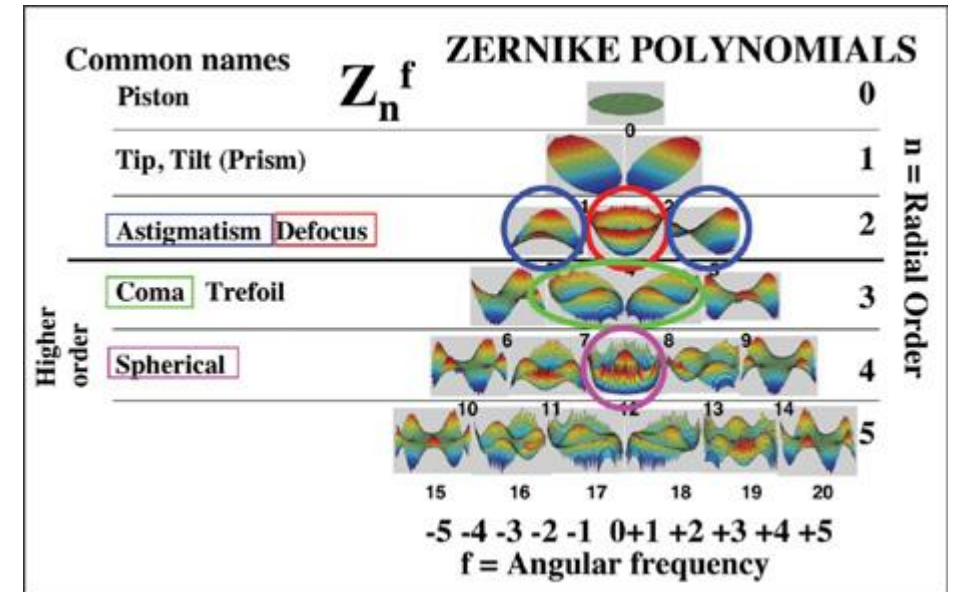
- Multi-meridian lens
- Predictable centration
- OZ – pupil alignment
- No lens flexure





# Front surface design

- Healthy eyes: 90% aberrations defocus and astigmatism
- Irregular eyes: 70% aberrations defocus and astigmatism
- Coma and spherical aberration main HOA in human eyes



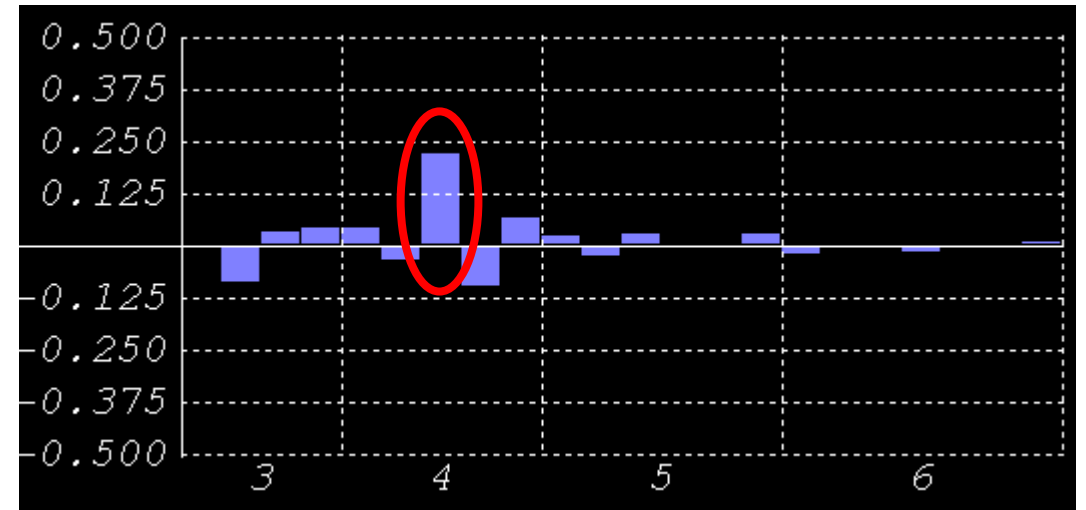
Source: **Correcting Aberrations with Contact Lenses** (clspectrum.com)



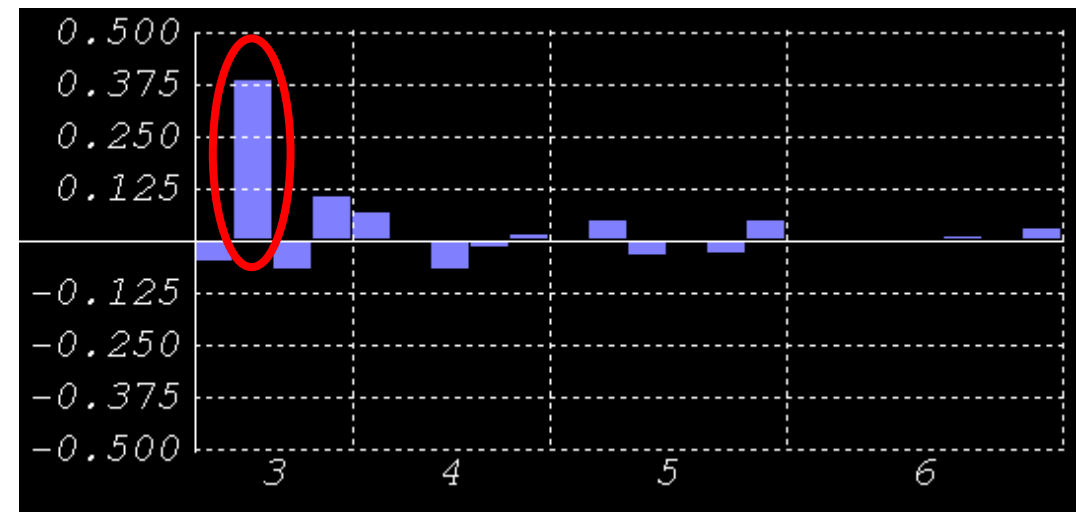
# Super vision

- Solved spherical aberation
  - Can be corrected
  
- Coma due to decentration
  - Can be corrected with the lens fit only

Without lens



With lens



# Conclusions

- Scleral lenses most suited for custom wave front aberation control
- Stable and predictable fit and movement required
- Front surface can correct spherical aberations
- Back surface equally important to prevent coma aberations

