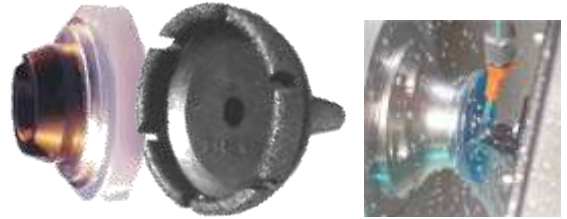




1

What is traditional surfacing?

- Lens blanks are generated to a rough curve in 1 or 2 meridians



2



3

What is traditional surfacing?

- The rough curve is smoothed against a hard lap shaped to the proper curve
- The smooth curve is polished against a padded hard lap



4



5



6

Traditional Surfacing

- These are only basic curves (spheres & Cylinders)



7

What is digital surfacing?

- Lens blanks are generated to a super smooth surface using sophisticated equipment.
- These surfaces can be basic or very complex



8

What is digital surfacing?

- The smooth surface is polished using a soft lap



Courtesy of Schneider Optical Machines

9

How is digital surfacing better?

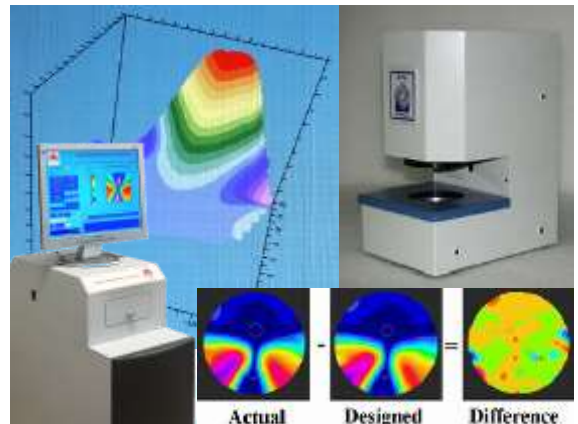
- We can produce superior accuracy (.01D)
- Progressives, bifocals and SV produced
- Aspheric or atoric curves and prism
- Or all, on one or both sides!
- The potential is boundless but it's the design that counts.

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What makes it better?

Design

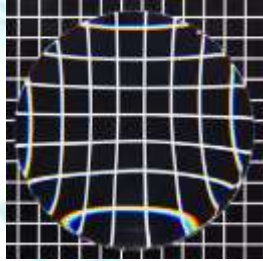
11



12

Distortions

- Defocus
- Astigmatism
- Spherical Aberration
- Coma

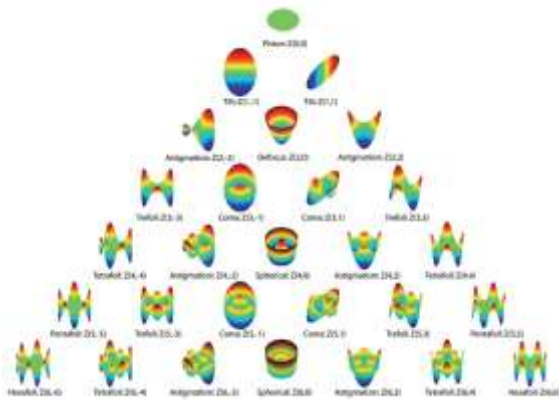


13

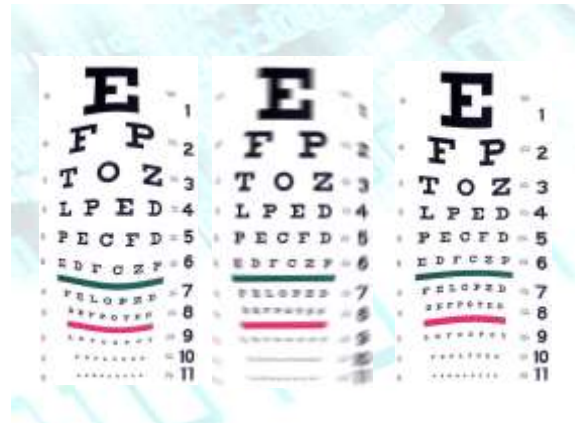
Distortion Occurs when

- The Wavefront is changed When:
- Light strikes a lens surface at an oblique angle or from the edges
- Light focuses differently from the edge of a lens than the center
- Etc.

14



15

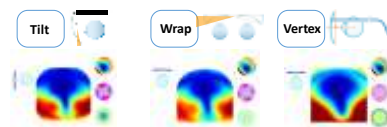


16

Changes in wearing conditions create aberrations

17

Changes in position of wear creates aberrations



18

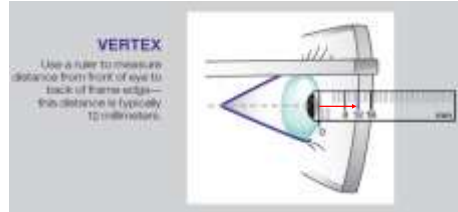
What about all these **NEW** measurements?

- Actually, measurements like **Vertex**, **Pantoscopic Tilt** and **Wrap Angle** (Position of Wear measurements) are not new
- Lens designers have been using **average** or **“default”** values when creating a new lens for years
- Now the ECP **has the ability** to take these measures for **each** patient individually – **personalizing** the product for that specific person

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Vertex

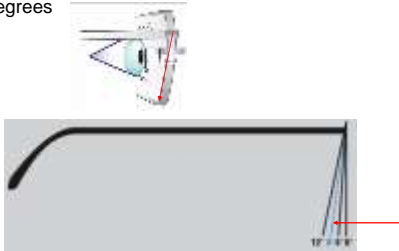
- Vertex is the distance between the back surface of the lens and the apex of the cornea.



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Pantoscopic Tilt

- Pantoscopic Tilt is the angle of the frame on the face in degrees



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Wrap Angle

- Wrap angle is the angle of the frame itself measured in degrees



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New Measurements

Eye Data

- ERC (Eye Rotation Center)

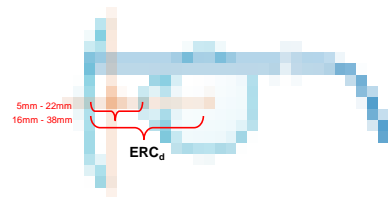
Behavioral Data

- Natural Head Posture (Head Cape)
- Head/Eye Ratio
- Stability Coefficient

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Eye Rotation Center (ERC_d)

- Eye Rotation Center (ERC_d) is the distance between the back of the lens and the point around which the eye rotates
- The ERC can be different for each eye



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Natural Head Posture

- Natural Head Posture (Head Cape Angle) refers to how a patient's head rests naturally on the neck and shoulders. This has a direct impact on alignment of the design

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H/E Ratio & Stability Coefficient

- Some people move their head more to see things, while other people move their eyes more
- The Head / Eye Ratio is a value that measures this
- The Stability Coefficient determines how consistently the patient sticks to his or her H/E Ratio



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What makes it better?

- Design can reduce traditional aberrations like marginal astigmatism.
- Extremely high accuracy allows for very nuanced design.
- Design can eliminate traditional distortions through lens shape changes at any point on the lens – EVERY POINT ON THE LENS!

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What Do The Designers Consider?

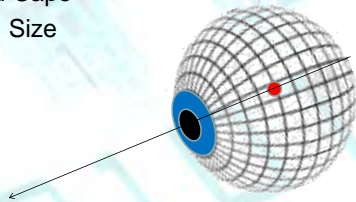
- Pantoscopic Tilt and Face Form
 - Tilting a lens in relation to the wavefront can cause distortion and refractive changes “as worn”.



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What Do The Designers Consider?

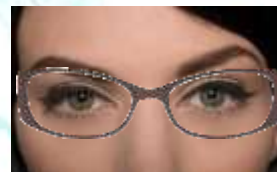
- Eye Rotation Centers
- Head Cape
- Pupil Size



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What Do The Designers Consider?

- Frame size
- Fitting Height
- Eye / Head movement



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Advantages

- Fewer Higher Order Aberrations
- Higher contrast sensitivity
- Optimized visual zones
- Personalized
 - Considers wearer's optical needs
 - Considers frame dimensions
 - Natural head position
- Super Wow factor!