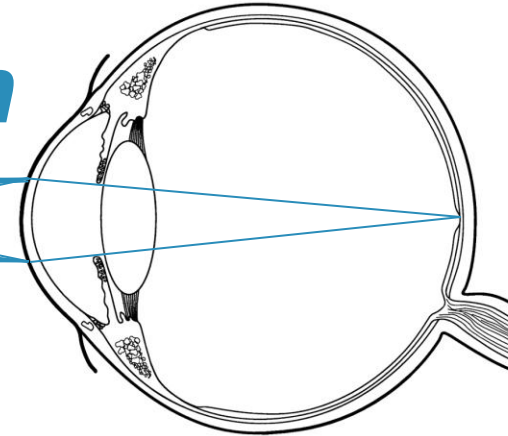


New Optical Technology for providing Extended Range of Vision



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Commercial Relationships:

H. Weeber and P. Piers are employees of Abbott Medical Optics Inc.

K. Waltz is a paid consultant for Abbott Medical Optics Inc

Purpose: To describe New Optical Technology for providing Extended Range of Vision.

Traditional IOL Solutions for Treating Presbyopia

- **Multi/Trifocal IOLs**

Work on the principle of simultaneous vision by splitting light into **multiple distinct** foci.

- **Accommodating IOLs**

Change in shape and power when the ciliary muscle contracts.

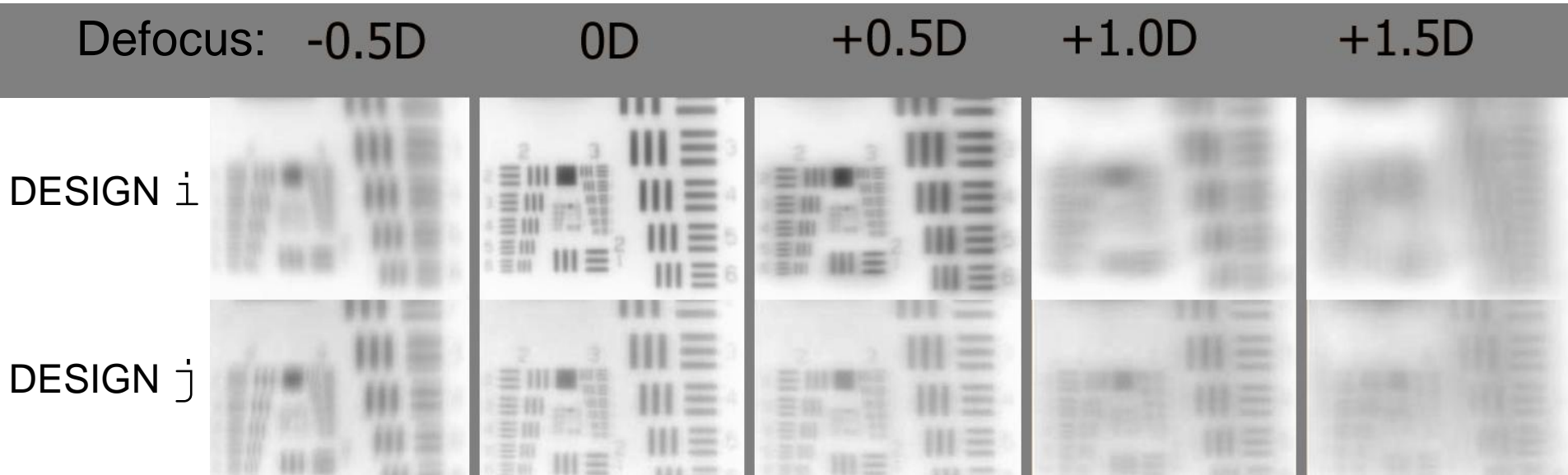
Traditional IOL Solutions for Treating Presbyopia



With traditional technology for the correction of presbyopia, we commonly think in terms of the **distinct distances** for which functional vision is provided.

Methods

A variety of optical technologies were considered. Sample lenses were evaluated pre-clinically on aspects of optical quality, expected visual outcome, and pre-clinical measures of dysphotopsia.



Results

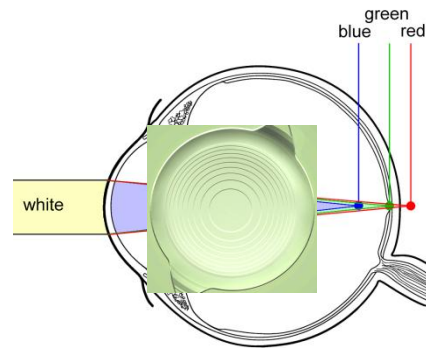
The new IOL design merges three optical technologies:

- (1) Correction of spherical aberration
- (2) Correction of chromatic aberration, using modified monofocal diffractive technology
- (3) Distribution of light over a range of distances, using modified diffractive technology.

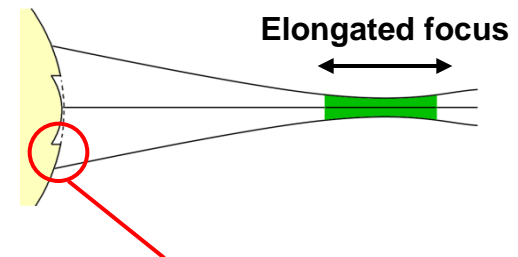
Mechanism of Action of Extending the Range of Vision

Compared to existing monofocal technology, the technology merges two complimentary enabling technologies to provide:

- 1) Continuous full range of vision due to the Unique Echelette design feature for elongating the IOL's focus.
- 2) High-quality vision due to TECNIS[®] Achromatic **monofocal diffractive** technology that corrects chromatic aberration yielding contrast enhancement.

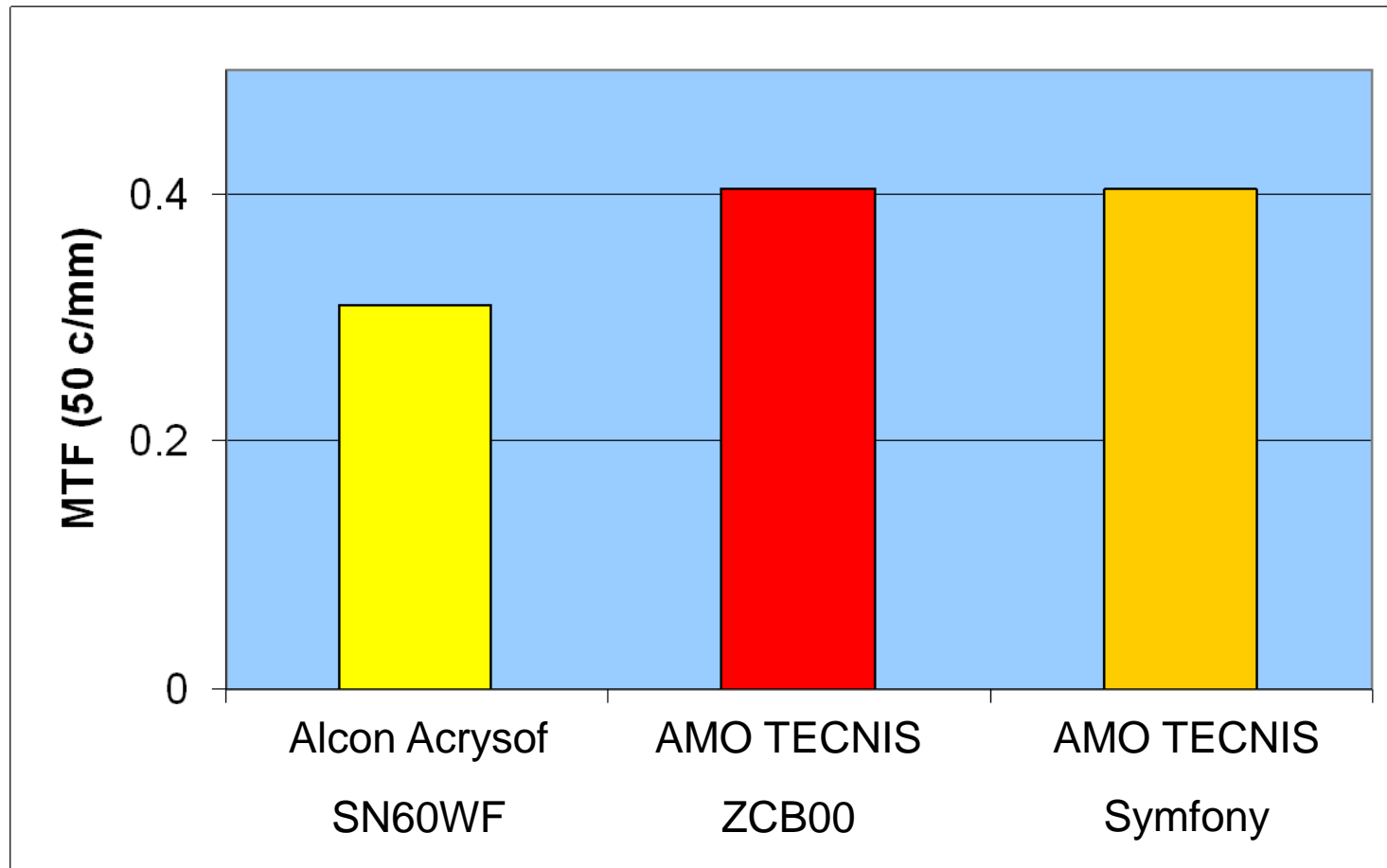


Achromatic
monofocal diffractive
technology



Echelette
design feature

Imaging quality in the FAR focus¹

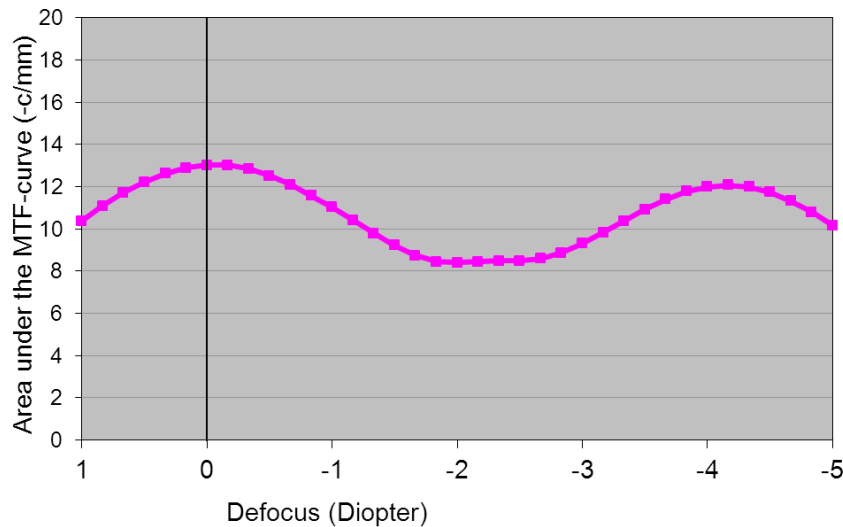


White light MTF at 50 c/mm measured in the ACE model eye for a 5 mm pupil

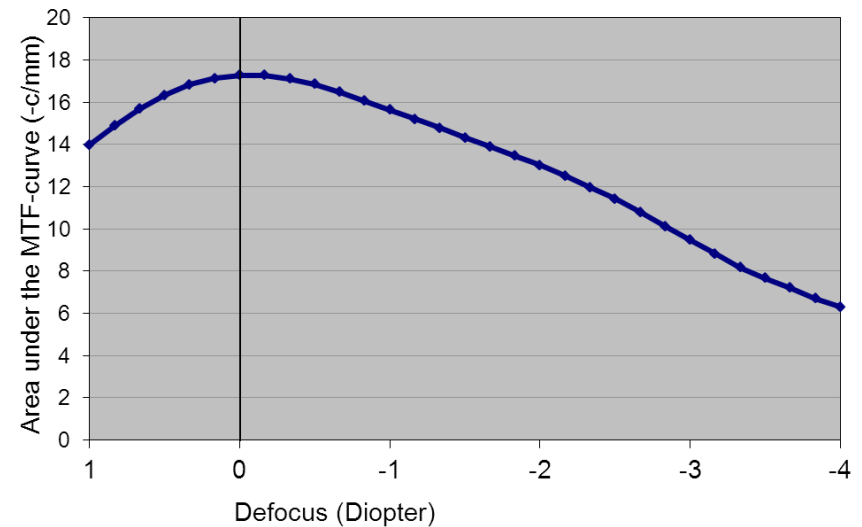
Through-focus MTF

The new optical technology demonstrates a continuous range of foci. This is shown here by the area under the MTF curve. The measurements were carried out in a model eye in white light and a 3-mm pupil diameter. The model eye mimics the average spherical aberration and chromatic aberration of the eye.

TECNIS Multifocal IOL



Extended Range of Vision IOL



Conclusions



Combination of new and existing diffractive and refractive technologies result in an IOL design with unique optical properties, suggesting that the optical design provides an extended range of vision, without sacrificing visual quality at distance.

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