Aspira© -aXA

Aspire to Functional Vision Improvement

HumanOPTICS

Functional Vision Improvement

Asphere and Aberrations

Spherical aberrations are known to lower the quality of vision.
Therefore, in difference to aberration-free aspheric designs, the **aberration-correcting** aspheric optic of the *Aspira*-aXA is designed to correct the spherical aberrations of the **complete visual system***.

The resulting projection of the incoming light focused onto the fovea enables the highest quality of vision possible compared to aberration-free or spherical IOLs, as shown in the simulations for dilated pupil and mean corneal aberration of elderly eyes on the right page.

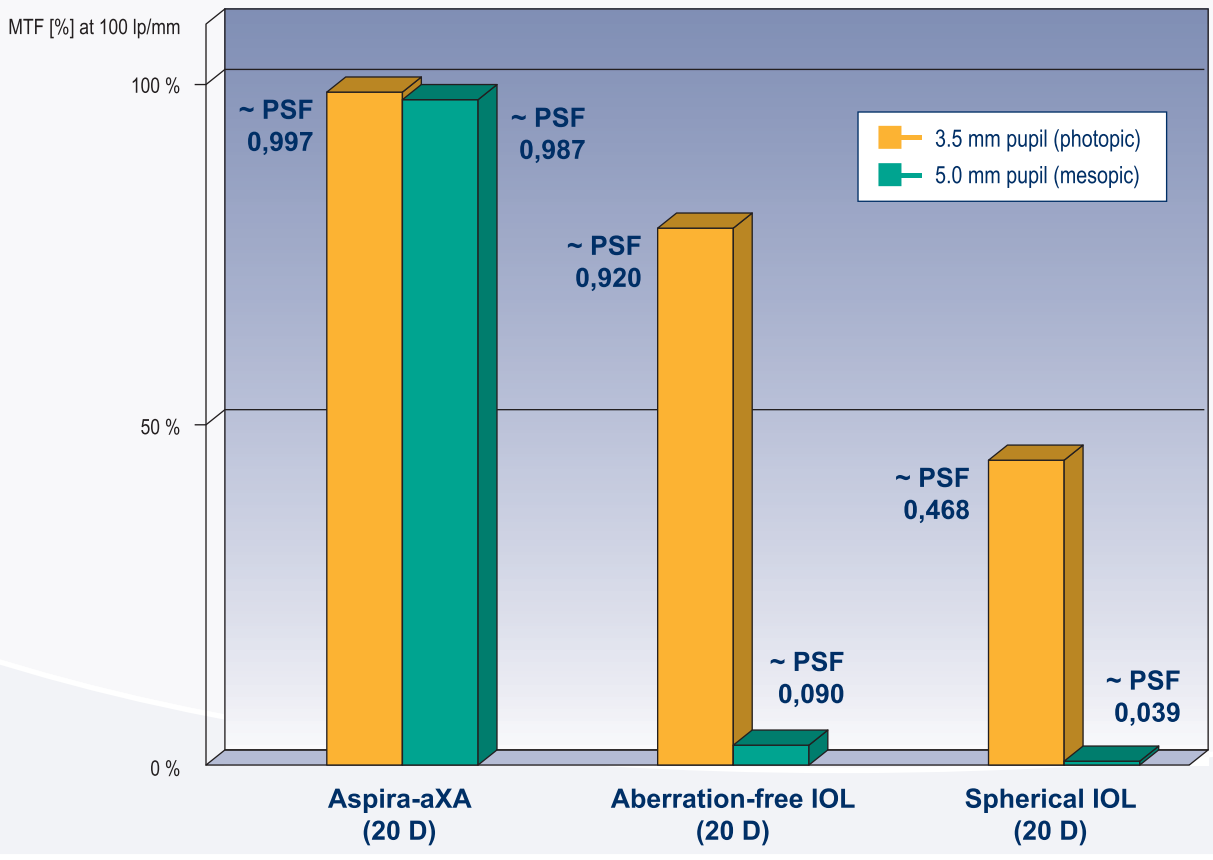
Our target: best image quality

Our development target is to achieve best image quality independent of IOL power.

Therefore the PSF (Point Spread Function) value, that quantifies and defines image quality, is kept constantly high (close to 1.0) for the entire optical system (cornea* plus IOL) independent of the IOL power.

**based on an average corneal spherical aberration of +0.274 µm*[1]*

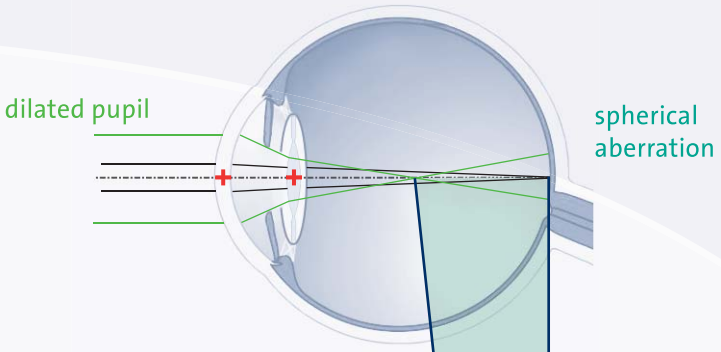
MTF and PSF performance measured with model eye* at 100 lp/mm at 3.5 (~photopic) and 5 mm pupil (~mesopic)



Conventional spherical IOL

Positive aberrations of cornea and IOL collectively arrive on the retina.

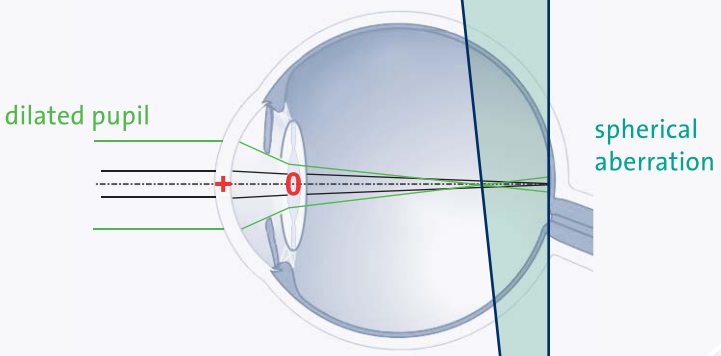
Diminished quality of vision



Aspheric, aberration-free IOL

Only the positive aberrations generated by the cornea arrive on the retina; the IOL itself acts neutral, not influencing the system aberration wise.

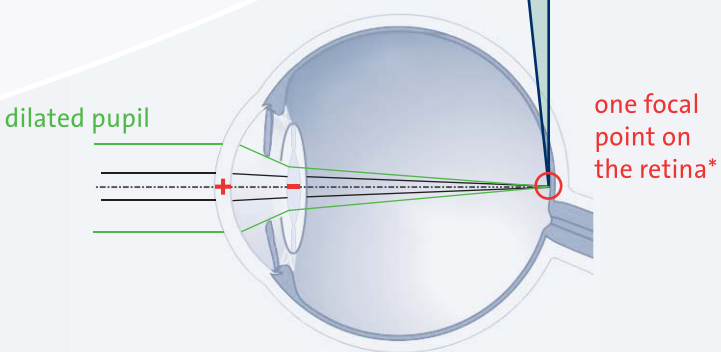
Partially improved vision



Aspheric, aberration-correcting IOL

The negative aberrations induced by the IOL compensate the positive aberrations of the cornea, creating one focal point on the retina without spherical aberrations.

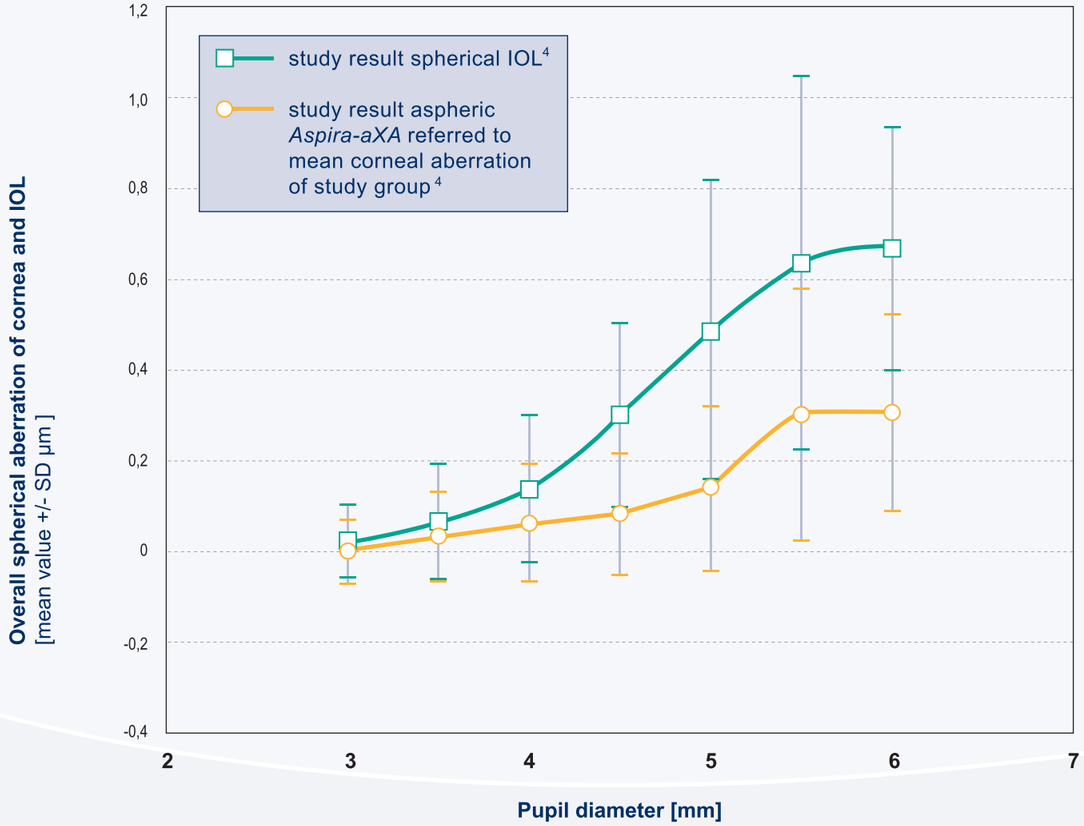
Improved quality of vision

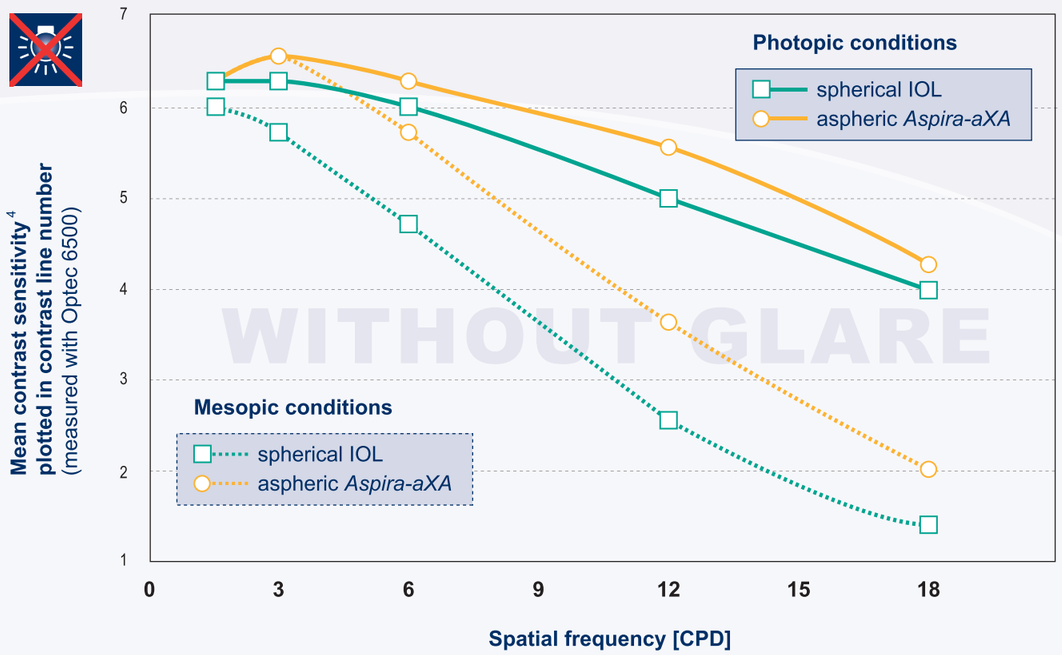


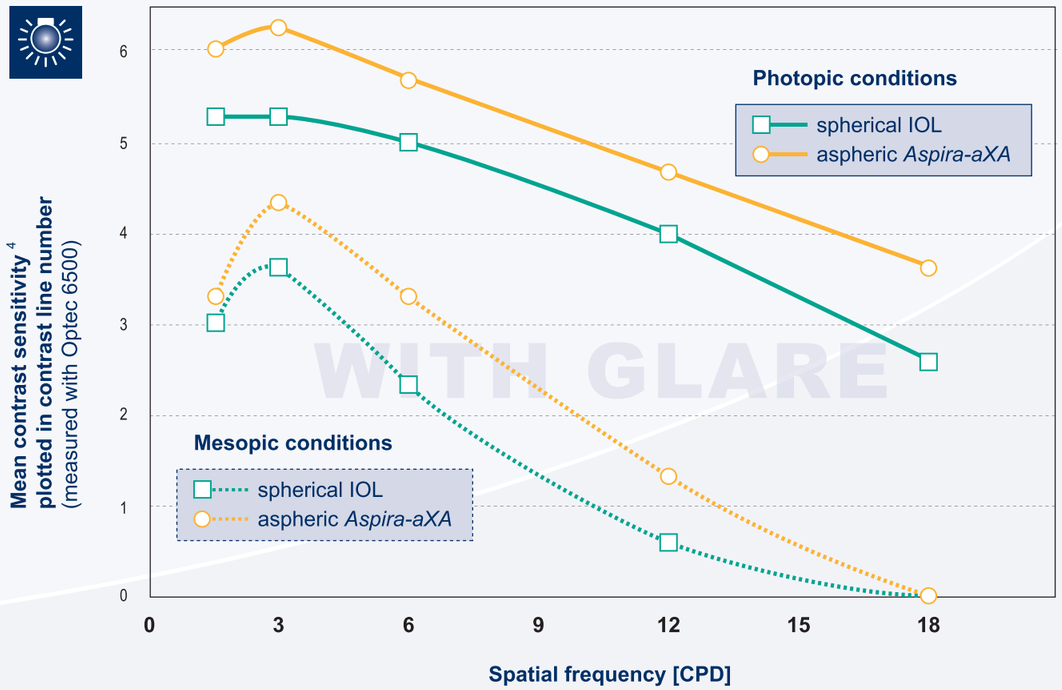
Aspira-aXA - Study Results

Intra-individual comparison of *Aspira-aXA* with spherical IOL of same lens design [2, 3]

- Total higher order aberration and spherical aberrations could be significantly reduced with the *Aspira-aXA* compared to the spherical control group.
- Average spherical aberration in the *Aspira-aXA* group was 0.04µm and 0.27µm in the spherical control group (at 4.5 mm pupil size).
- Measurement of contrast sensitivity in mesopic and photopic condition with and without glare showed better results for the aspheric *Aspira-aXA*: one level higher of contrast sensitivity was achieved.
- Also subjectively all patients reported better contrast in the eye which received the aspheric IOL.







IOL Characteristics

Design and Technical Details

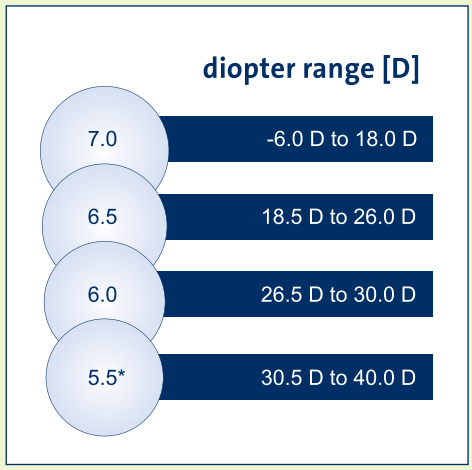
Outstanding large diopter range from -6.0 D up to 40.0 D.

„X“-optimized optic diameter depending on dioptrical power

The lower the IOL-power, the bigger the optic diameter (up to a unique optical zone of 7.0 mm).

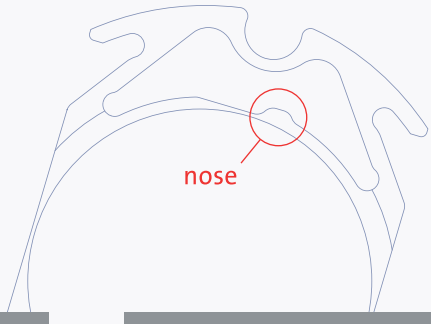
- Hence, resuming the relation between myopic eyes and wider pupils.
- Adds an intra-operative benefit: wider view onto the ocular fundus (especially in highly myopic eyes) is enabled.

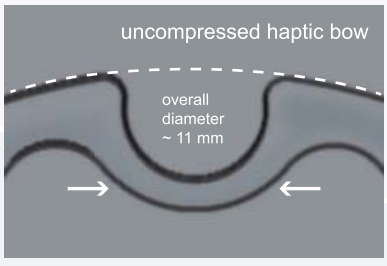
The higher the IOL-power, the smaller the optic diameter for thinner optic design and better injection properties (2.2 cartridge).

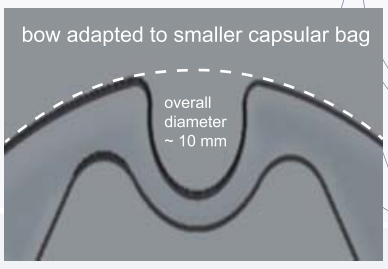


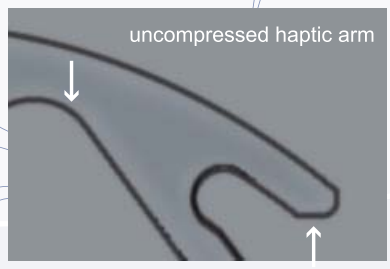
Special modified frame haptic design

- Overall diameter 11.0 mm
- Haptic „noses“ avoid mispositioning
- Adjustable haptic-segments to fit all sizes of capsular bags and for stable optic centration even in case of excessive capsular bag shrinkage [4]









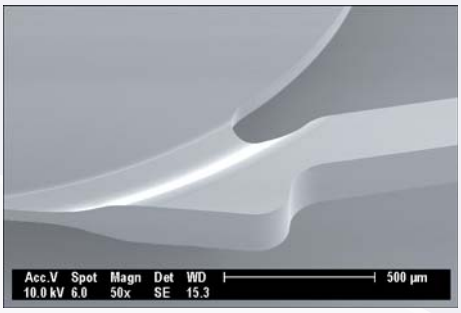
*optical rim is still 6.0 mm, only optical effective part is reduced to 5.5 mm

Material and Manufacturing

Our high precision polish free manufacturing process enables an **extraordinary sharp optic edge design**[5,6], especially for hydrophilic IOLs.

This prevents PCO, whereas mentioned edges are at least comparable or even sharper than hydrophobic acrylic or silicone lenses[5].

The superior production leads to an optic quality of highest level in surface shape, micro- / nanostructure and transparency.



Since 1999 HumanOptics manufactures IOLs of MicroCryl material, showing:

- Superb manufacturing quality with highest precision; tested and proven in all issues regarding biocompatibility, optical performance and mechanical stability
- No reports on long term postoperative material opacification
- Negligible silicone oil adhesions
- No formation of glistenings

[1] Baiko G, Haigis W, Steinmueller A. Distribution of corneal spherical aberration in a comprehensive ophthalmology practice and whether keratometry can predict aberration values. J Cataract Refract Surg 2007; 33:848-858

[2] Lindenschmid A, Küchle M, Schönherr U, et al. Intraindividual Comparison of Higher Order Aberrations (HOA), Mesopic, Photopic and Scotopic Contrast Sensitivity and Visual Acuity After Implantation of Aspherical and Spherical IOLs. Presentation Wavefrontcongress 2007

[3] Lindenschmid A, Winkler von Mohrenfels C, Küchle M, et al. Contrast sensitivity with HumanOptics Aspheric MC X11 ASP and Spherical MC 611 MI. Electronical Poster ASCRS 2007

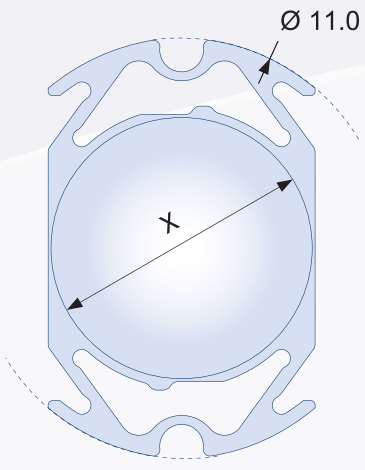
[4] Winkler von Mohrenfels C, Lohmann C.P. Performance of a new aspheric micro incision lens HumanOptics MC X11 ASP. Presentation ESCRS 2006 Book of Abstracts; 162

[5] Werner L, Tetz M, Feldmann I et al. Evaluating and defining the sharpness of intraocular lenses: Microedge structure of commercially available square-edged hydrophilic intraocular lenses. J Cataract Refract Surg 2009; 35:556-566

[6] Nanavaty M, Spalton D et al. Edge profile of commercially available square-edged intraocular lenses. J Cataract Refract Surg 2008; 34:677-686

Remark: Aspira-aXA was formerly called MC X11 ASP

Aspira©-aXA



When using any of our products, it is mandatory that you follow the instructions inserted within the package.

Aspire to aberration correction!

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