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Conventional lenses are optimized for vision during daylight, that means for bright light. During twilight and night, pupils are enlarged and vision might be increasingly blurred because of a higher negative impact of various high and low order eye aberrations.

PUPIL SIZE VARIES DEPENDING ON:

- LIGHT CONDITIONS
- AGE
- VIEWING DISTANCE
- FURTHERMORE, DIGITALISATION IS CHANGING VISUAL REQUIREMENTS IN ALL AGE GROUPS

The results of the study are the basis for a completely new lens series:

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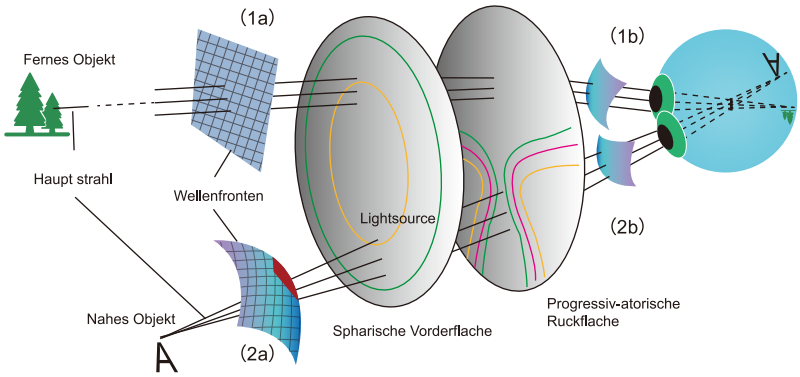
Lenses with night vision mode → Pupil Optimization
The visual sharpness is tangibly increased, in particular in dark and difficult light environments.



CR FREEFORM TECHNOLOGIES

Retina Focus Optimization: Big Data Eye Model

Lenses are usually only optimized for vision during daylight and bright light conditions. During twilight and at night, pupils are however enlarged, and vision might be increasingly blurred because of a higher negative impact of various high and low order eye aberrations.
In an empiric Big Data study, the correlation between pupil size, prescription and eye aberrations of more than one million spectacle wearers have been analyzed. The result of the study are the basis for our CR Freeform lenses with night vision mode: the visual sharpness is tangibly increased, in particular in dark and difficult light environments.

- Optimization of the entire lens surface with global wavefront calculation of the surface with 30,000 measuring points
- Taking into account the correlation between the add values (addition), the approximate age of the customer and his/her expected remaining pupil adjustment
- Combined with the prescription (SPH / CYL / A) the algorithm finds an optimal correction which considers the variance of the pupil size and reduces the negative effects of average HOAs to ensure the best possible vision

At brightness the pupils are small. The image on the retina is sharp.

In poor lighting conditions, the pupils are large. The image on the retina becomes blurred due to imaging aberrations (HOA).

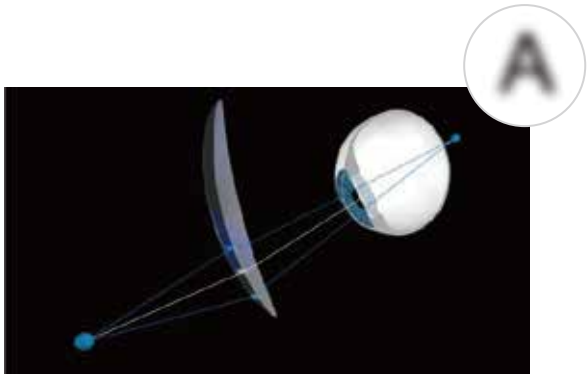
CR Freeform optimized lenses provide higher contrast and sharper vision even in difficult light conditions and with a large pupil.

CR FREEFORM TECHNOLOGIES

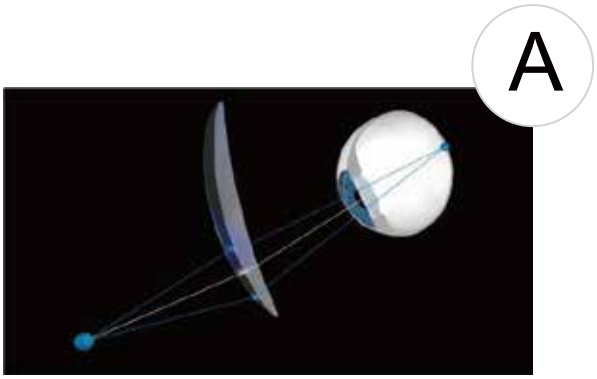
Retina Focus Optimization

Sharp vision and fatigue-free reading

- When looking through a lens, the rays run obliquely to the lens plane due to the pantoscopic tilt, face form angle and lowering of the gaze when looking through a near reference point of a progressive lens
- This causes a difference between the order values of a lens and the measured values of the lens optimized for position of wear
- By taking the real situation of wear into account, the spectacle wearer is provided with exactly the prescription he or she needs for vision at near distance. With the Retina Focus Optimization, an imaging true to refraction on the retina is ensured



Without Retina Focus Optimization: blurred imaging



With Retina Focus Optimization: imaging true to refraction

CR FREEFORM TECHNOLOGIES

Freeform Technology

Highest vision acuity over the entire lens

- The freeform technology is a 3D-production including all individual parameters
- 7,000 individual calculated optical points over the lens surface optimized the customer vision potential
- Consumer data from past decades are used to continually refine and improve
- Only the combination of real time optimization and free-form technology makes it possible to calculate and produce power optimized and individual lenses.

Conventional technology

Standard conventional lenses offer highest acuity in the optical center but distortions increase in direction to the lens edge

Freeform technology

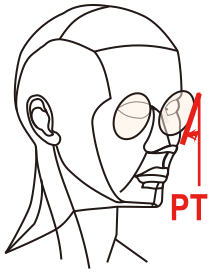
Freeform lenses offer highest acuity over the entire lens

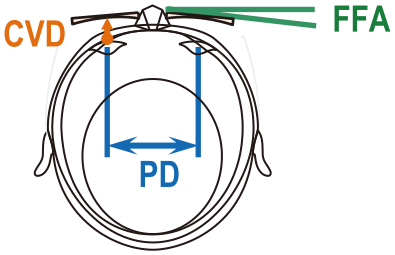
CR FREEFORM TECHNOLOGIES

Individual Parameters Optimization

Largest vision zones for all frames and independent from the individual physiognomy. Significantly reduced swimming effect Each face is unique so that the fit of the frame is also unique. It can be described exactly by the four parameters of interpupillary distance, pantoscopic tilt, face form angle and corneal vertex distance

- A standard situation of wear is assumed for the fit of a pair of spectacles in the lens calculation for all non-individual lenses. Average values are then used for the four parameters. If the real situation in wear ultimately differs from this standard situation of wear, this has a negative effect on the performance of the lens
- The interpapillary distance of the spectacle wearer also enters the inset optimization. The main vision line of the lens is thus ideally adapted to the natural convergence behavior of the customer
- Individual lenses therefore provide significantly improved imaging properties by taking account of the real situation of wear





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Images of Visual Impressions

Visual impression without prescription

Visual impression with CR Freeform lenses