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A prospective, randomised clinical Evaluation of Intensity Trifocal IOL vs. PanOptix Trifocal IOL

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IVCRC / DJ Apple Laboratory: Financial Disclosure 2024/2025

Afidera³
Alcon^{1,2,3,4}
AMO/Johnson&Johnson^{1,2,3,4}
Carl Zeiss Meditec^{1,2,3,4}
Contamac¹
Cristalens^{1,2,3,4}
Elios^{1,3,4}
Eyebright³
EyeD¹
Eyedeal¹
EyeYon^{1,2,4}
Fluoron¹
Hanita^{1,2,3,4}
Hoya^{1,2,3}
Kowa^{1,2,3}
Oculus^{1,3}
Presbia¹
Rayner^{1,2,3,4}
Teleon^{1,2,3}
1stQ¹



Klaus Tschira Stiftung
Gemeinnützige GmbH



1 = Research Grants; 2 = Travel Expenses; 3 = Lecture Fees; 4 = Consulting

Monofocal⁺/EDOF/Trifocal-IOLs



Teleon
Lentis/Acunex
Quantum



BVI/Physiol
Isopure



Santen Xact
Mono-EDoF IOL



Rayner
RayOne EMV



EVOLUX



Hoya
Vivinex
Impress



B & L
Akreos
Adapt AO

Monofocal⁺



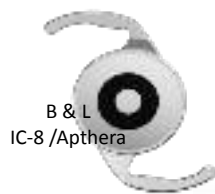
J & J TECNIS
Symphony



J & J TECNIS
PureSee



Zeiss
AT Lara



B & L
IC-8/Aphera



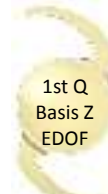
Lentis Comfort
MF15



AcrySof IQ
Vivity™



SAV – IOL SA
Lucidis



1st Q
Basis Z
EDOF



B & L
LuxSmart

EDoF-IOL



J & J TECNIS
Synergy



Zeiss
AT Lisa Tri



Zeiss
AT
Elana



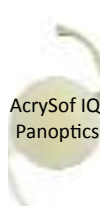
Physiol/BVI
Triumph



VSY Acriva
Trinova



Rayner
Trifocal



AcrySof IQ
Panoptics



Hanita
Intensity



1st Q
Basis Z
Trifocal



Hoya
Vivinex
Gemetrics



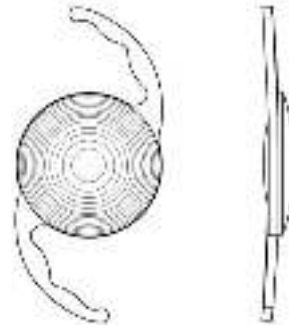
Cristalens
Artis Symbiose
Mid & Plus

Trifocal-IOL

Trifocal IOLs: New Ideas/Developments



Dynamic Light Utilization (DLU) Technology



IntensityTrifocal IOL (Hanita)

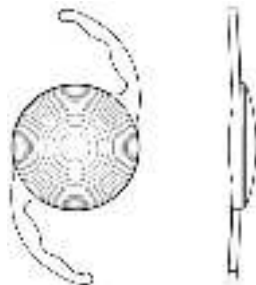


Technical Data: Hanita Intensity Multifocal IOL

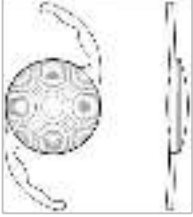


DLU TECHNOLOGY

The Intensity lens employs **Dynamic Light Utilization (DLU) technology**, an optical configuration allowing exceptional **light efficiency** and high visual acuity **at all distances** and lighting conditions.



The lens profile consists of **12 smooth steps** of different heights that create **five foci symmetrically distributed around zero order** at **intermediate distance**. In other words, the refractive focus goes to intermediate vision, as opposed to conventional trifocal lens designs. The lens profile of the Intensity is divided into three zones, each of which was **optimized by the DLU algorithm**, a proprietary iterative algorithm intended to achieve **maximal light-utilization efficiency**.

Parameter	Intensity 50 - 70mm IOL
Design	
Asphericity	Positive spherical IOL
Total diameter	13 mm
Optic diameter	6 mm
Aperture	5
Power range	2 to 40 (0.5D increments)
Add components	+1.5D +3.0D
Optic design	Aspheric diffractive bifocal IOL with pupil optimization Light transmittance 90.5%
Material	Hydrophobic Acrylic 25% water content, with UV blocker and Natural Yellow visible light filter
Sphere	0.00 to 0.50
Design features	C Leap with 3° angulation Total Diameter: 13mm Optic Diameter: 6mm 1.2mm
Insertion	



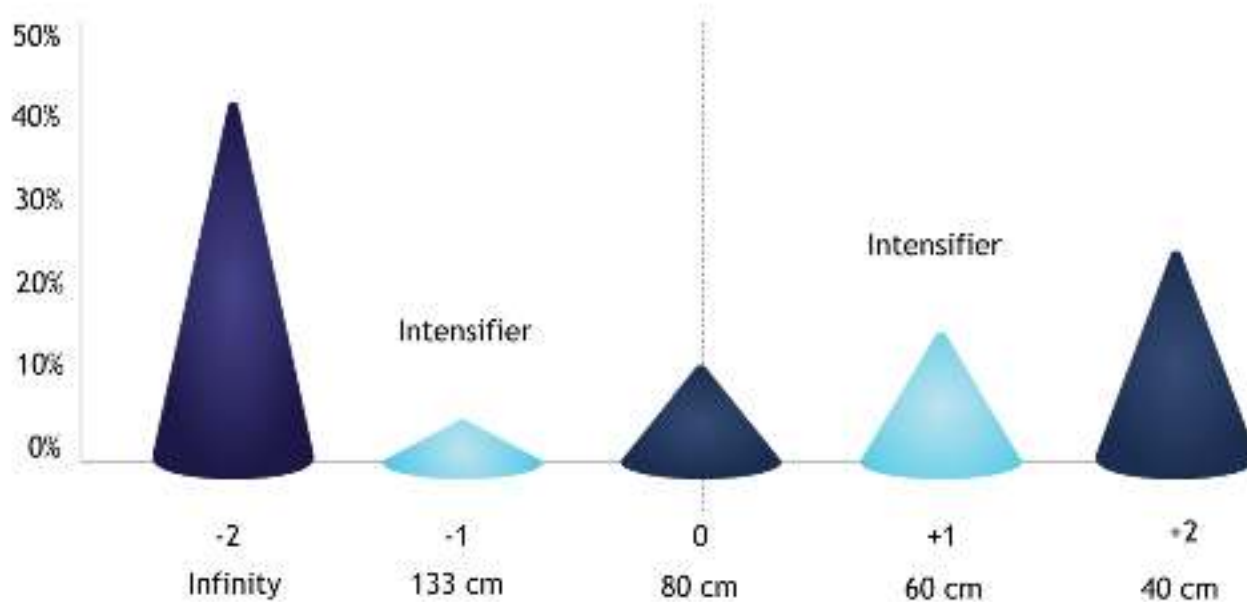
*Data on file: International Vision Correction Research Center (IVCRC), University Eye Clinic Heidelberg, Germany



Technical Data: Hanita Intensity Multifocal IOL



Symmetric Foci Distribution



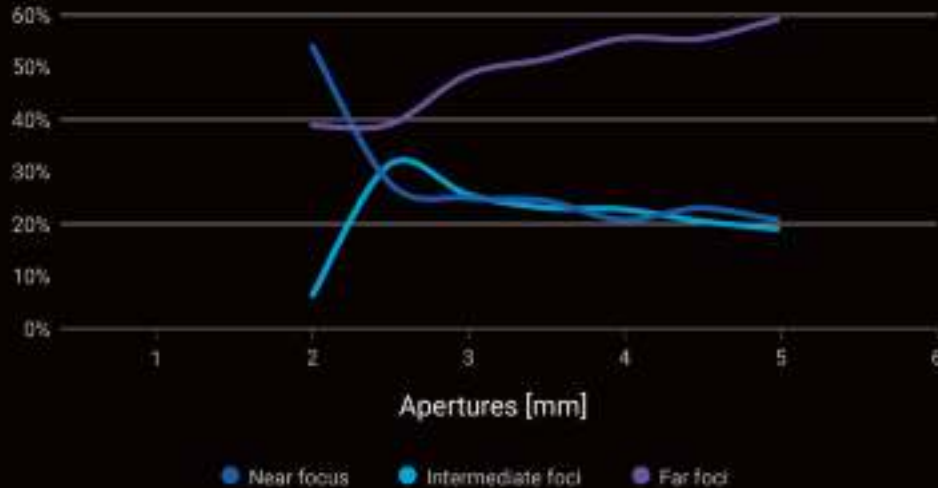
- Pentafoveal IOL, diffractive and spherical aberration adjustment,
- Light is utilized to and from multiple foci, amplifying the utilization of the light, reducing halos in theory.



Technical Data: Hanita Intensity Multifocal IOL

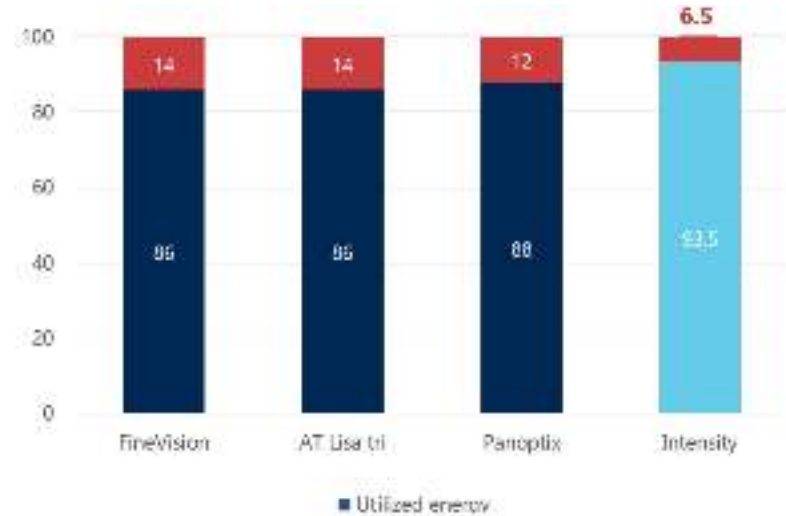


Intensity distribution between foci



Energy utilization (%)

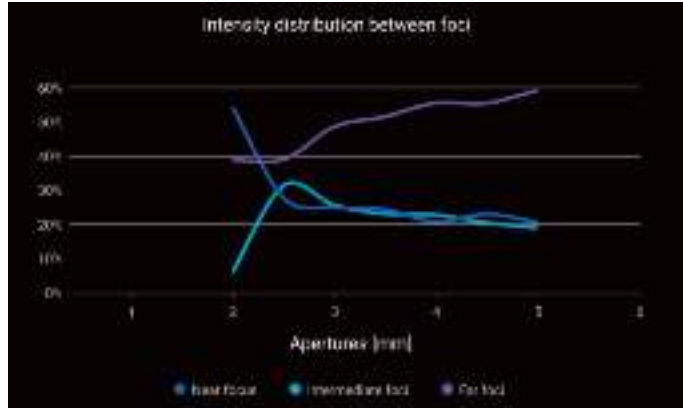
46% decrease in lost light > decreased visual disturbances



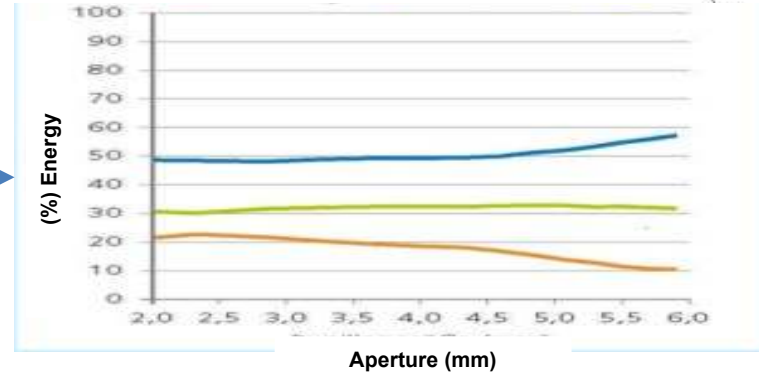
*Data on file: Hanita Lenses



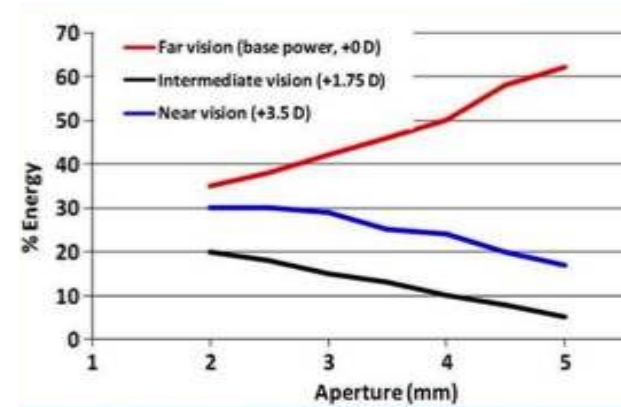
Technical Data: Hanita Intensity Multifocal IOL



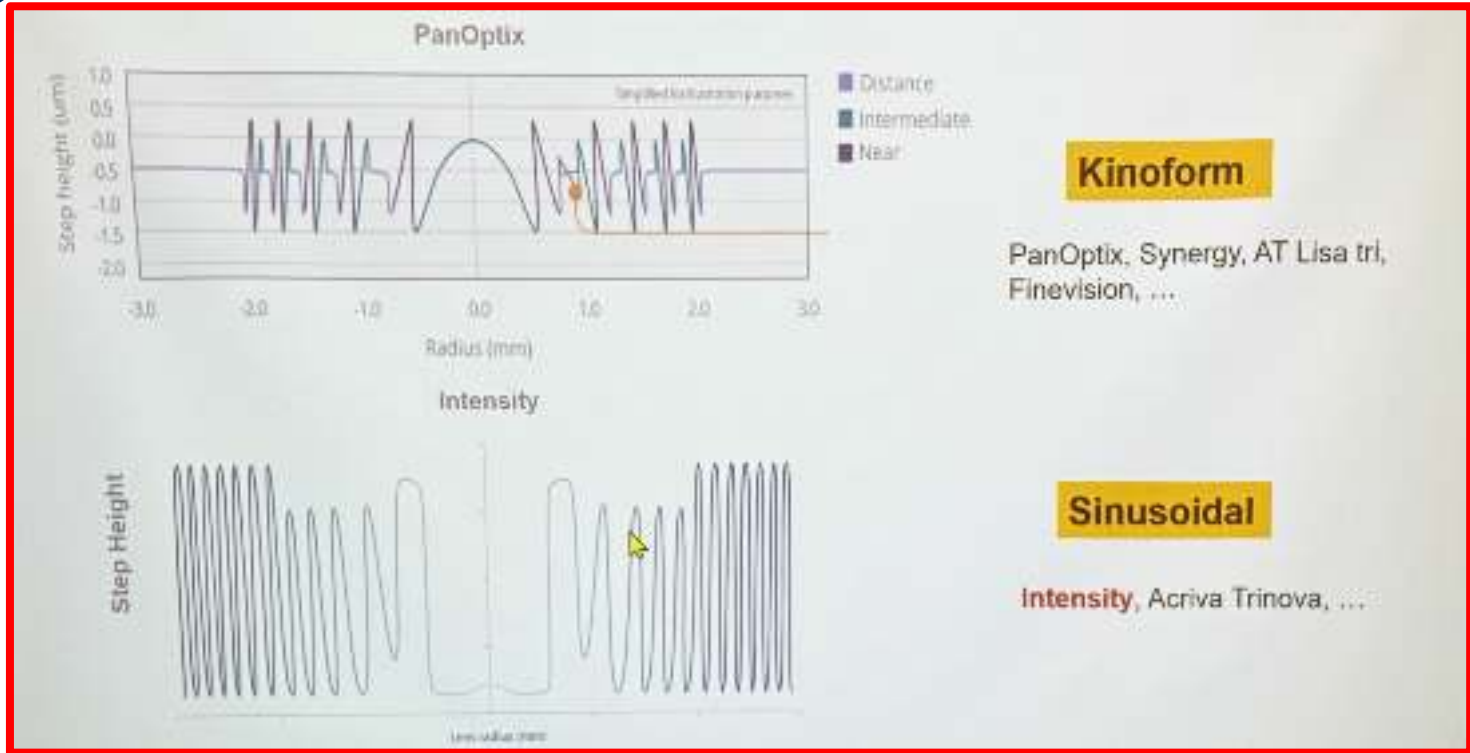
AT LISA tri*
(Zeiss)



FineVision
(BVI)

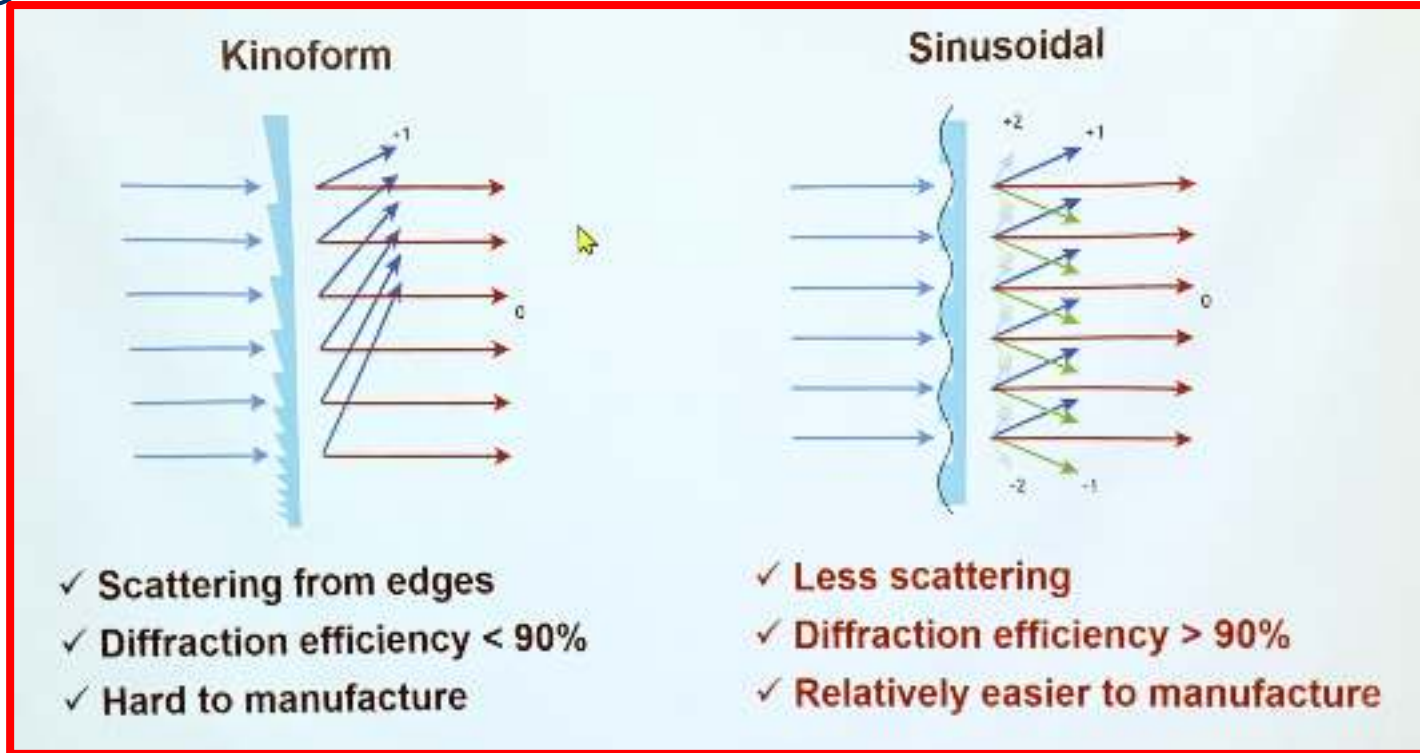


Hanita Intensity Trifocal-IOL*



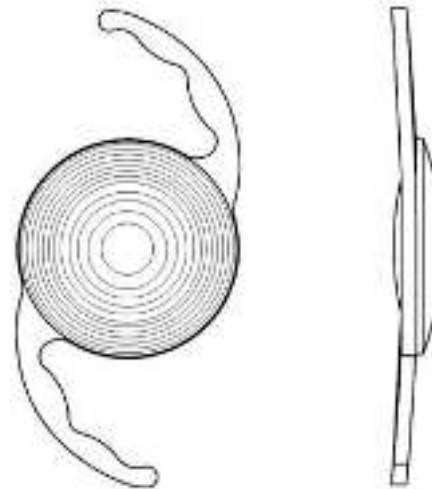
* Seung Pil Bang: Presented at the Hanita Intensity Symposium, Seoul, 08.07.2025

Hanita Intensity Trifocal-IOL*



* Seung Pil Bang: Presented at the Hanita Intensity Symposium, Seoul, 08.07.2025

Clinical Evidence on Intensity IOL





Clinical results of the Hanita Intensity IOL*



62 Eyes of 31 Patients

	Preop	1 day postop	1 month	3 months	6 months
CDVA	X	X	X	X	X
CTVA	X		X	X	X
UMVA	X	X	X	X	X
CTIRVA			X	X	X
CMVA	X		X	X	X
JWA			X	X	X
CTWA			X	X	X
Min best correction	X		X	X	X
CS			X		X
Binocular vision	X	X	X	X	X
Binocularity	X				
CR	X	X	X	X	X
Qual. of vision				X	X
DFC					X
QoV - NAVG-10				X	

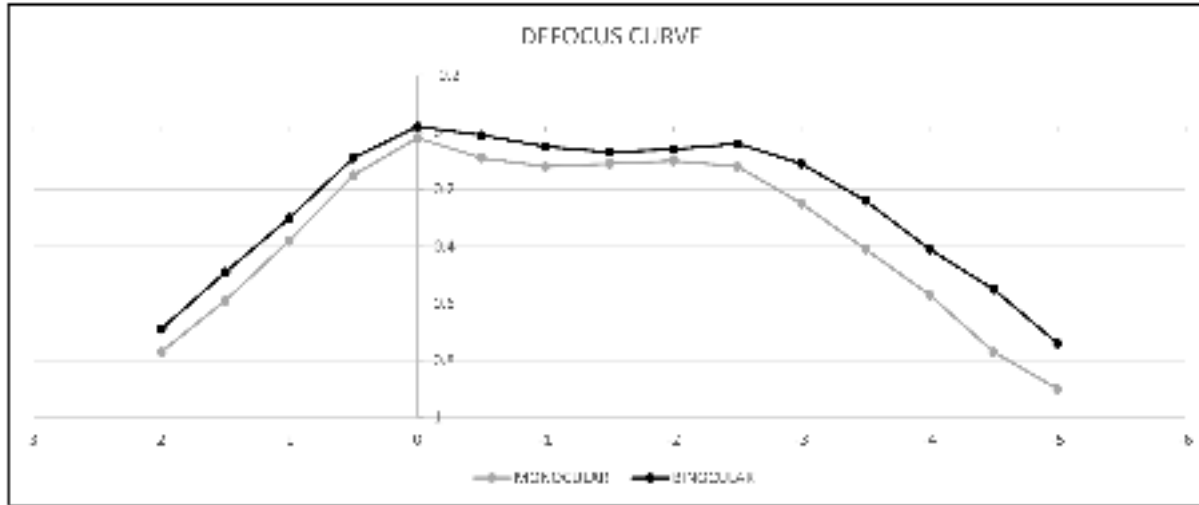


*Alio JL, Banir EM: The Hanita Intensity: A new Pentafoveal Diffractive IOL. Lecture at the 41st Congress of the ESCRS 2023, 08.-12.09.2023, Vienna, Austria



Clinical results of the Hanita Intensity IOL*

Defocus curve



Monocular	LogMAR	Snell	OU	LogMAR	Snell
Max VA range +0.5 to -3.0	0.03	6/6.4	Max VA range +0.5 to -3.0	-0.02	6/5.7
Min VA range -0.5 to -3.0	0.25	6/10.6	Min VA range +0.5 to -3.0	0.11	6/7.7

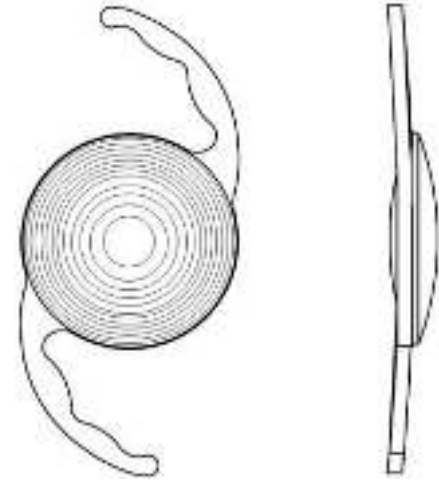


*Alio JL, Banir EM: The Hanita Intensity: A new Pentafoveal Diffractive IOL. Lecture at the 41st Congress of the ESCRS 2023, 08.-12.09.2023, Vienna, Austria



Clinical results of the Hanita Intensity IOL*

- Ongoing Study: 29 patients (58 Eyes)
- Bilaterale implantation of the Hanita Intensity IOL
- IOL-Design: Aspheric multifocal diffractive
- Mean Age: 64
- 1/3/6/12-Months-Follow-up: Uncorrected and corrected distance, intermediate and near visual acuity
- Defocuscurve
- Halo & Glare Simulator
- Patient questionnaire

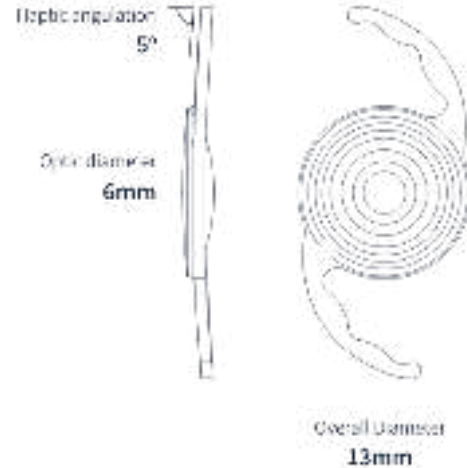


*Data on file: International Vision Correction Research Center (IVCRC), University Eye Clinic Heidelberg, Germany

Comparison of 2 Trifokal-IOLs



**Alcon AcrySof IQ
PanOptix (Toric)**



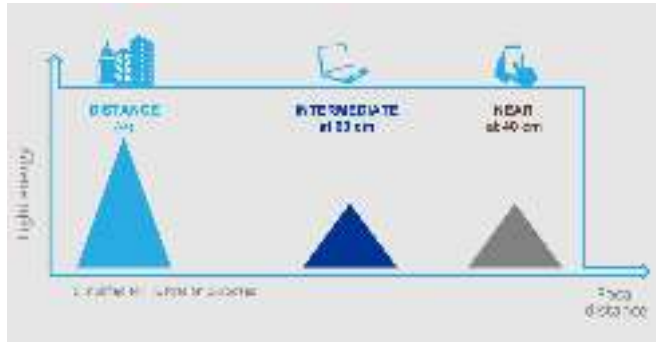
**Hanita Intensity
(Toric)**



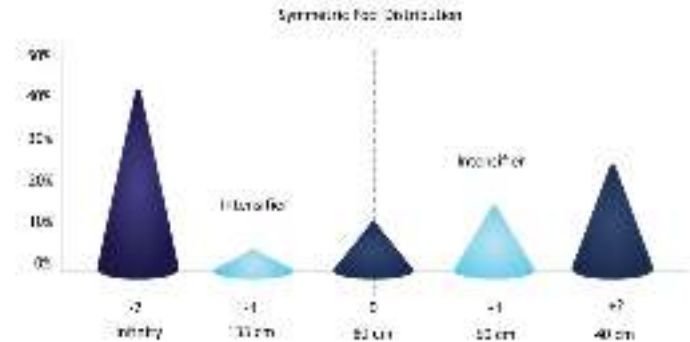


Hanita Intensity Trifocal-IOL

AcrySof IQ PanOptix	Hanita Intensity
Light Utilisation: 88% (12% Loss)	Light Utilisation: 93,5% (6,5% Loss)



ENLIGHTEN® Optical Technology



DLU® Technology
(Dynamic Light Utilization)

Results

Ongoing study

Number of Patients (n), (Eyes)	Hanita Intensity SL 29 (58)	Alcon PanOptix 29 (58)
1 month after surgery	n=26	n=28
3 months after surgery	n=23	n=24
Mean age	66 ± 10 Jahre	70 ± 10 Jahre
M : F	13 : 16	12 : 17



Visual Acuity monocular: 1 vs 3 Months

Visual Acuity (logMAR)	Intensity		PanOptix	
	monocular 1 Month post-OP	monocular 3 Months post-OP	monocular 1 Month post-OP	monokular 3 Months post-OP
UDVA (4 m)	0.04 ± 0.14	0.02 ± 0.12	0.00 ± 0.11	-0.04 ± 0.12
CDVA (4 m)	-0.04 ± 0.12	-0.06 ± 0.09	-0.06 ± 0.10	-0.10 ± 0.07
UIVA (80 cm)	0.03 ± 0.11	0.06 ± 0.11	0.02 ± 0.10	-0.01 ± 0.07
DCIVA (80 cm)	0.03 ± 0.13	0.03 ± 0.08	0.06 ± 0.19	-0.01 ± 0.08
UNVA (40 cm)	0.04 ± 0.12	0.0 ± 0.10	0.04 ± 0.11	-0.02 ± 0.07
DCNVA (40 cm)	0.04 ± 0.10	0.01 ± 0.09	0.04 ± 0.10	0.03 ± 0.07



*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg



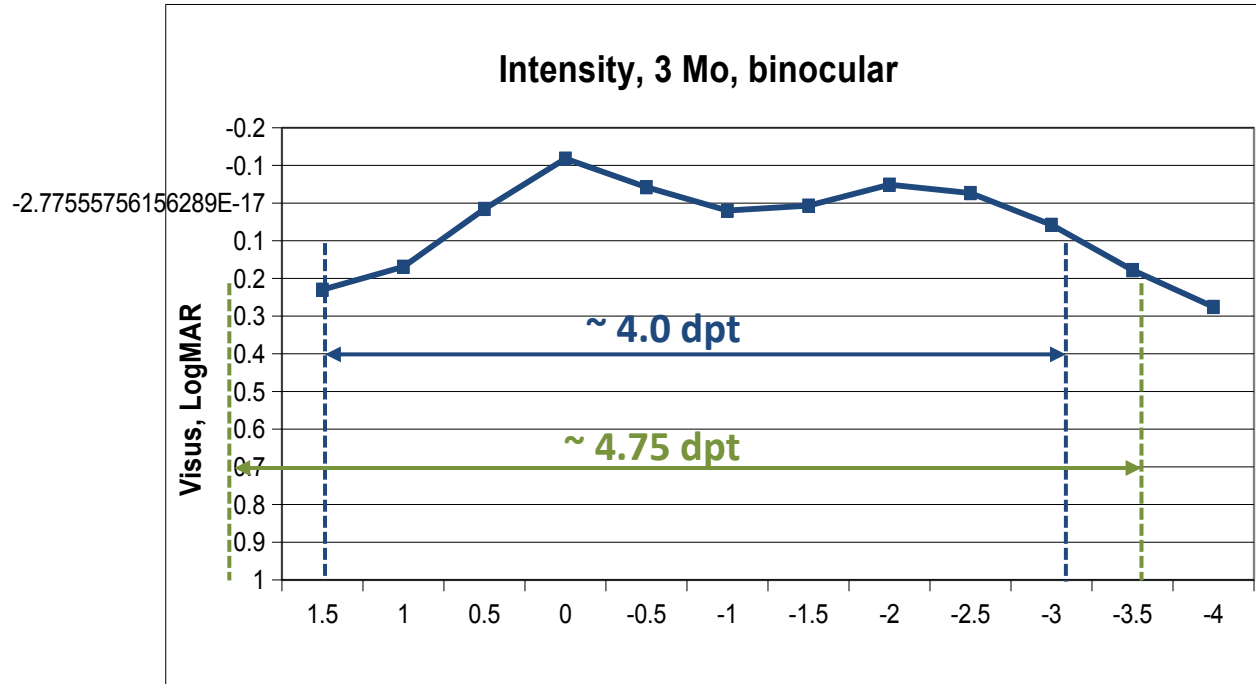
Visual Acuity binocular: 1 vs 3 Months

Visual Acuity (logMAR)	Intensity		PanOptix	
	binocular 1 Month post-OP	binocular 3 Months post-OP	binocular 1 Month post-OP	binocular 3 Months post-OP
UDVA (4 m)	-0.06 ± 0.12	-0.08 ± 0.09	-0.09 ± 0.09	-0.12 ± 0.07
CDVA (4 m)	-0.10 ± 0.10	-0.12 ± 0.08	-0.12 ± 0.08	-0.15 ± 0.05
UIVA (80 cm)	-0.04 ± 0.09	-0.03 ± 0.05	-0.04 ± 0.07	-0.06 ± 0.07
DCIVA (80 cm)	-0.03 ± 0.10	-0.04 ± 0.05	-0.04 ± 0.06	-0.06 ± 0.07
UNVA (40 cm)	-0.03 ± 0.08	-0.05 ± 0.09	-0.04 ± 0.06	-0.03 ± 0.06
DCNVA (40 cm)	-0.02 ± 0.07	-0.06 ± 0.07	-0.02 ± 0.07	-0.03 ± 0.07



*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg

Intensity: Defocus Curve 3 Months, binocular



Intensity bin

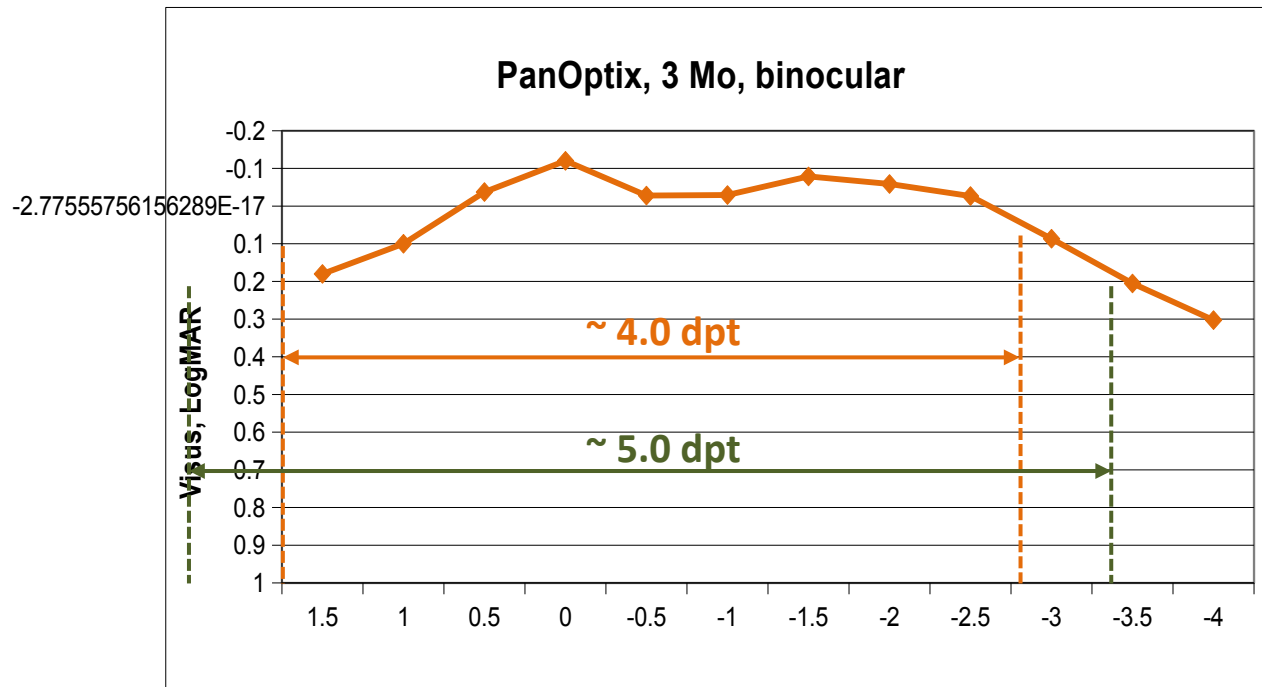
0.10 logMAR or better:
from +0.75 to -3.25 dpt

0.20 logMAR or better:
from +1.25 to -3.50 dpt



*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg

PanOptix: Defocus Curve 3 Months, binocular



PanOptix bin

0.10 logMAR or better:
from +1.0 to -3.0 dpt

0.20 logMAR or better:
from +1.5 to -3.5 dpt

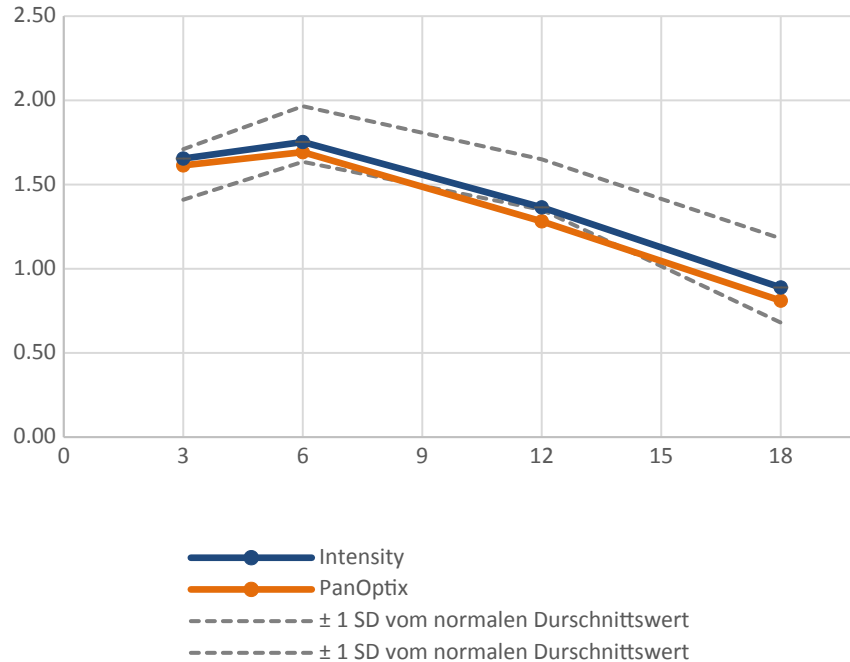


*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg

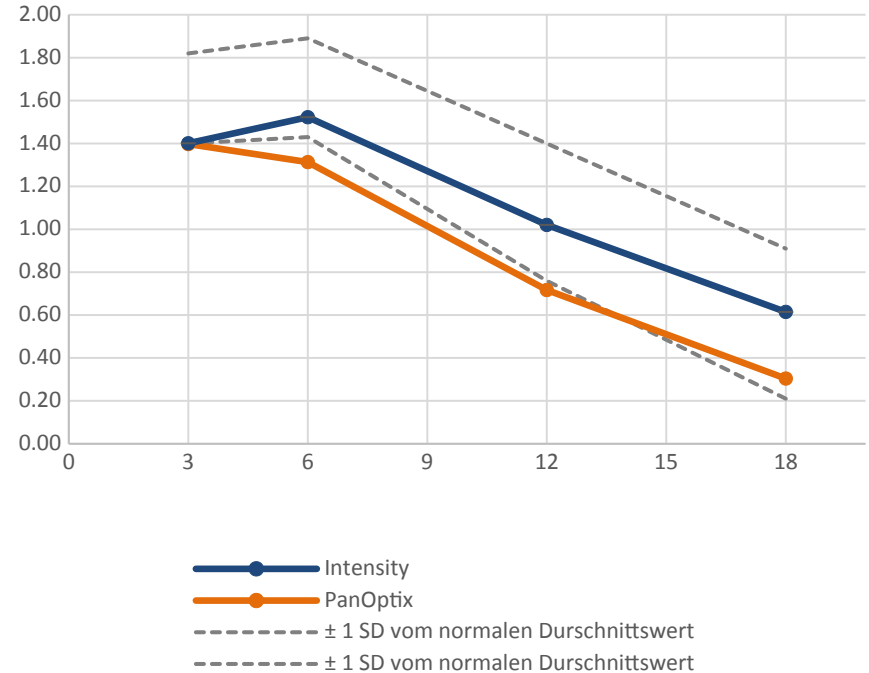


Contrast Sensitivity: 3 Months, monocular

Monocular, photopic without Glare



Monocular, mesopic without Glare

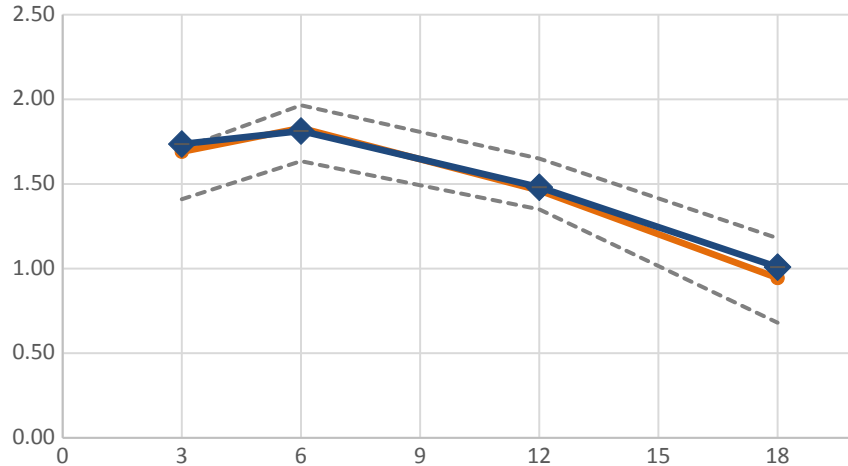


*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg



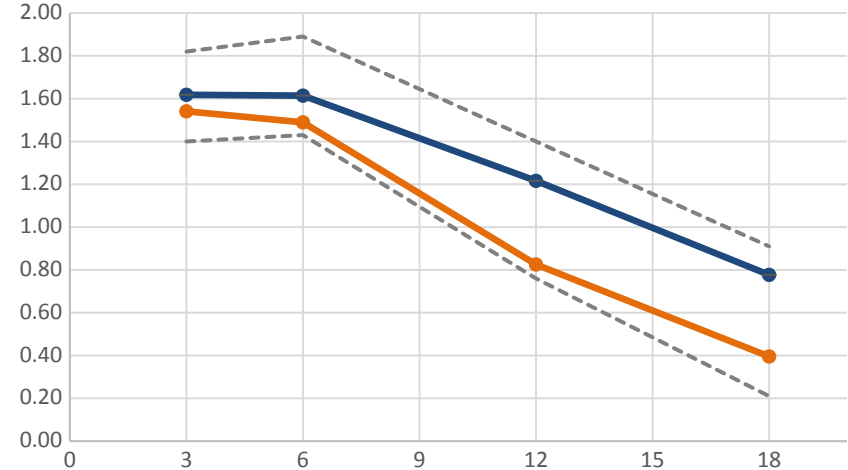
Contrast Sensitivity: 3 Months, monocular

Binocular, photopic without Glare



—◆— Intensity
—●— PanOptix
- - - ± 1 SD vom normalen Durchschnittswert
- - - ± 1 SD vom normalen Durchschnittswert

Binocular, mesopic without Glare



—◆— Intensity
—●— PanOptix
- - - ± 1 SD vom normalen Durchschnittswert
- - - ± 1 SD vom normalen Durchschnittswert

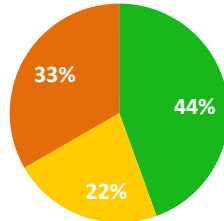


*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg

Halo and Glare: 3 Months postop

Intensity - Halos

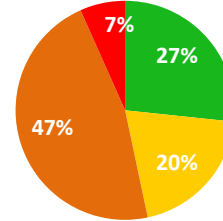
■ no ■ slight ■ moderate ■ severe



67%
No to slight Halos
0% !
Severe Halos

PanOptix - HALOS

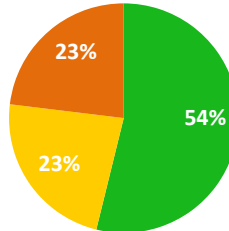
■ no ■ slight ■ moderate ■ severe



47%
No to slight Halos
7%
Severe Halos

Intensity - Glare

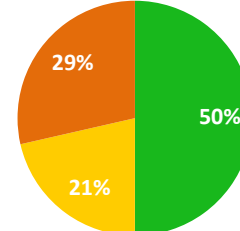
■ no ■ slight ■ moderate ■ severe



77%
No to slight Glare

PanOptix - Glare

■ no ■ slight ■ moderate ■ severe



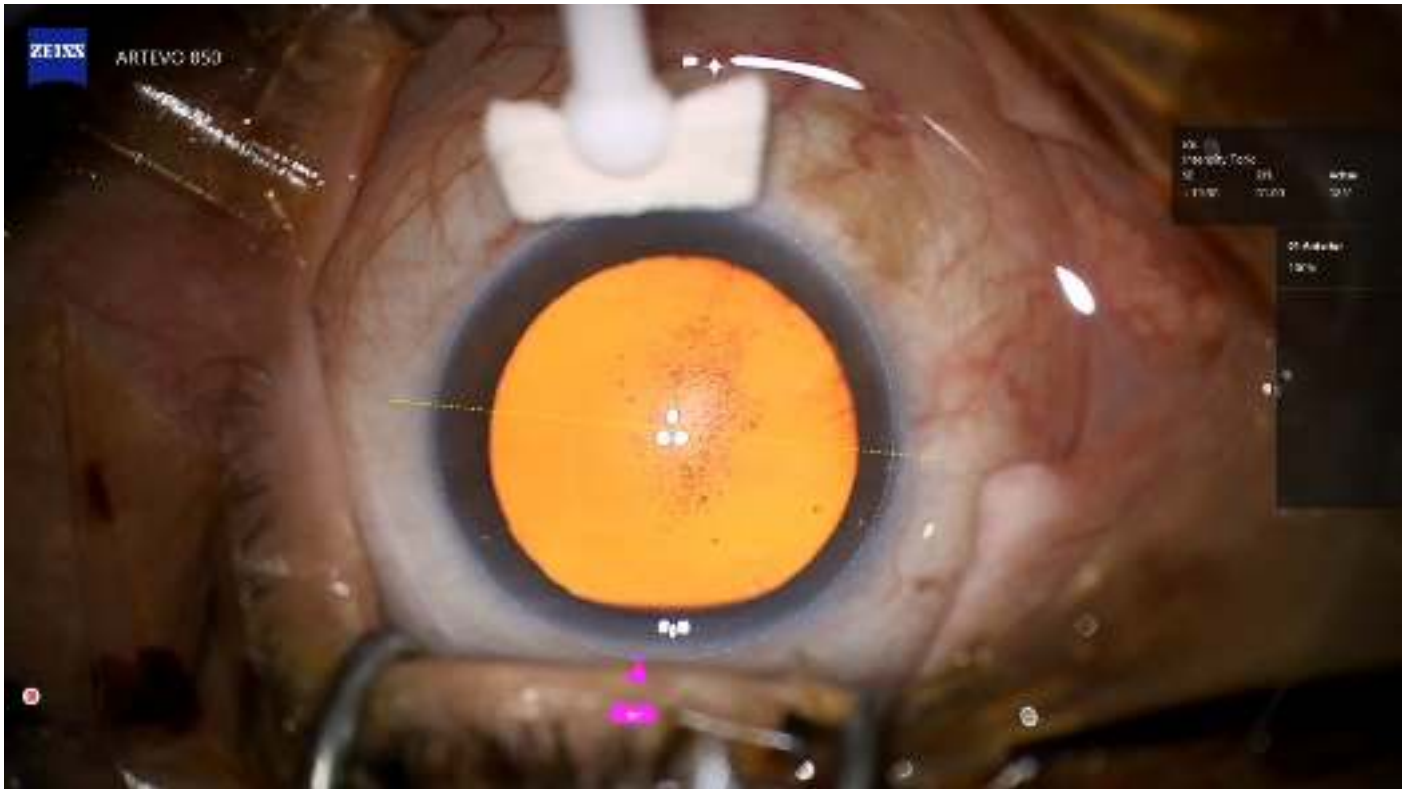
71%
No to slight Glare



*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg



Surgical Procedure



Case 1

Patient: 55y female patient

Presentation:

First presentation at our clinic for pre-cataract examination due to decreased vision over the last 6 months, particularly in the distance. The patient is motivated for a trifocal IOL.

Medical History and Previous Findings:

Unremarkable, except for age-related cataract

Subjective Refraction:

R: +0.50 / -0.50 / 55°

L: +0.25 / 0 / 0°

Visual Acuity with Correction:

R/L: 1.0 (20/20)

Organ Findings:

R/L: normal, age-related cortical nuclear cataract (Cat. corticonuclearis)

OD				IOL Berechnung				OS			
verr.								lin.			
Incision on steep axis plus OCCI											
Keratometer				Keratometer				Keratometer			
ax. Pos.	ax. Keratometr.	ax. W.	ax. W.	ax. Pos.	ax. Keratometr.	ax. W.	ax. W.	ax. Pos.	ax. Keratometr.	ax. W.	ax. W.
180° Unidirectional	180° Merid.	180°	180°	180° Unidirectional	180° Merid.	180°	180°	180° Unidirectional	180° Merid.	180°	180°
Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt
Nomenclature:				Nomenclature:				Nomenclature:			
AL: 24.70 mm	AL: 24.70 mm	AL: 24.70 mm	AL: 24.70 mm	AL: 24.67 mm	AL: 24.67 mm	AL: 24.67 mm	AL: 24.67 mm	AL: 24.67 mm	AL: 24.67 mm	AL: 24.67 mm	AL: 24.67 mm
K1: 3.27 mm	K1: 3.27 mm	K1: 3.27 mm	K1: 3.27 mm	K1: 3.28 mm	K1: 3.28 mm	K1: 3.28 mm	K1: 3.28 mm	K1: 3.28 mm	K1: 3.28 mm	K1: 3.28 mm	K1: 3.28 mm
K2: 4.39 mm	K2: 4.39 mm	K2: 4.39 mm	K2: 4.39 mm	K2: 4.38 mm	K2: 4.38 mm	K2: 4.38 mm	K2: 4.38 mm	K2: 4.38 mm	K2: 4.38 mm	K2: 4.38 mm	K2: 4.38 mm
K3: 12.6 mm	K3: 12.6 mm	K3: 12.6 mm	K3: 12.6 mm	K3: 12.5 mm	K3: 12.5 mm	K3: 12.5 mm	K3: 12.5 mm	K3: 12.5 mm	K3: 12.5 mm	K3: 12.5 mm	K3: 12.5 mm
K: 5.30 mm	K: 5.30 mm	K: 5.30 mm	K: 5.30 mm	K: 5.25 mm	K: 5.25 mm	K: 5.25 mm	K: 5.25 mm	K: 5.32 mm	K: 5.32 mm	K: 5.32 mm	K: 5.32 mm
CR: -0.20 dpt @ 24°	CR: -0.20 dpt @ 24°	CR: -0.20 dpt @ 24°	CR: -0.20 dpt @ 24°	CR: -0.15 dpt @ 21°	CR: -0.15 dpt @ 21°	CR: -0.15 dpt @ 21°	CR: -0.15 dpt @ 21°	CR: -0.17 dpt @ 21°	CR: -0.17 dpt @ 21°	CR: -0.17 dpt @ 21°	CR: -0.17 dpt @ 21°
TR: 5.30 mm	TR: 5.30 mm	TR: 5.30 mm	TR: 5.30 mm	TR: 5.25 mm	TR: 5.25 mm	TR: 5.25 mm	TR: 5.25 mm	TR: 5.32 mm	TR: 5.32 mm	TR: 5.32 mm	TR: 5.32 mm
STR: -0.15 dpt @ 38°	STR: -0.15 dpt @ 38°	STR: -0.15 dpt @ 38°	STR: -0.15 dpt @ 38°	STR: -0.08 dpt @ 21°	STR: -0.08 dpt @ 21°	STR: -0.08 dpt @ 21°	STR: -0.08 dpt @ 21°	STR: -0.10 dpt @ 21°	STR: -0.10 dpt @ 21°	STR: -0.10 dpt @ 21°	STR: -0.10 dpt @ 21°
Hastalenses Intensity				Hastalenses Intensity				Hastalenses Intensity			
-large-				-large-				-large-			
Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt
K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00
K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00
K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00
K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00
CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00
TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00
STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00
Hastalenses Intensity				Hastalenses Intensity				Hastalenses Intensity			
-large-				-large-				-large-			
Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt	Ref: +0.00 dpt
K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00	K1: 0.00
K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00	K2: 0.00
K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00	K3: 0.00
K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00	K: 0.00
CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00	CR: 0.00
TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.00
STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00	STR: 0.00



Case 1: 3 months Post-OP

The patient is very satisfied and would repeat the procedure.

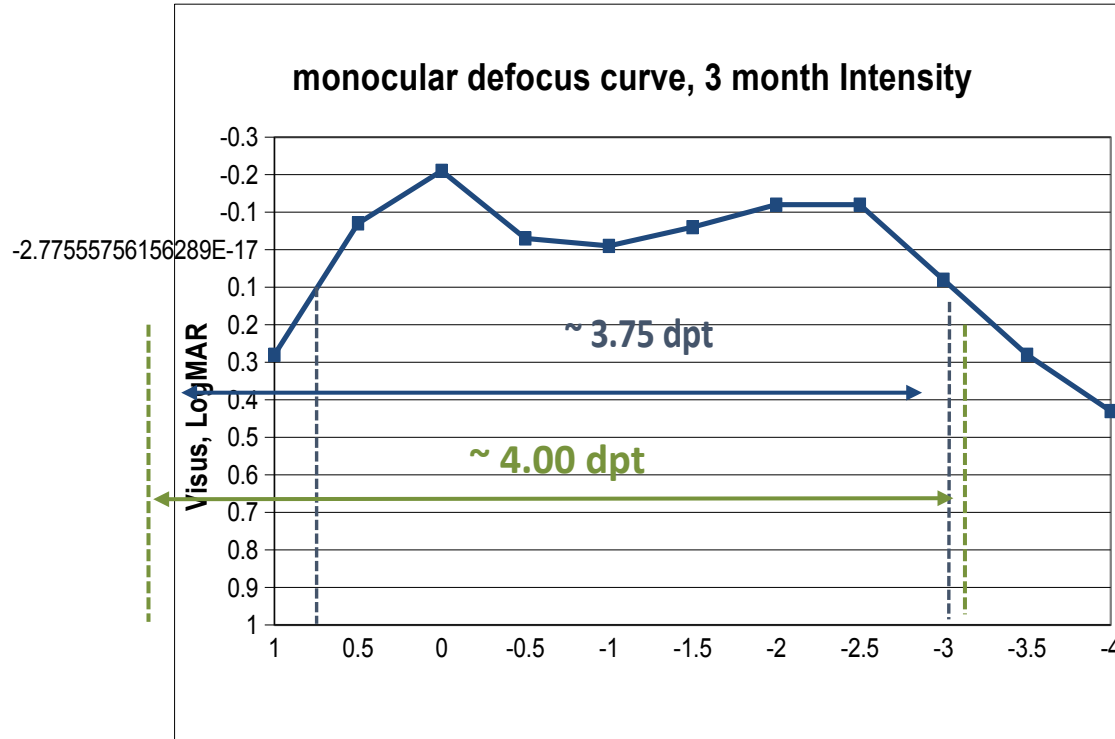
Halo and glare are only mild, no issues with night vision, no difficulties in daily life.

Organ Findings:

R/L: Normal pseudophakia

	OD	OS	OU
Subjective Ref.	0 / 0 / 0°	+0.25 / -0.25 / 180°	
UDVA 4 m (logMAR)	-0.12	-0.12	-0.20
CDVA 4 m	-0.12	-0.18	-0.20
UIVA 80 cm	-0.02	-0.04	-0.04
DCIVA 80 cm	-0.02	-0.06	-0.06
UNVA 40 cm	-0.12	-0.12	-0.12
DCNVA 40 cm	-0.12	-0.12	-0.12

Case 1: Defocus curve: 3 months, monocular



Intensity mono

0.10 logMAR or better:
from +0.75 to -3.0 dpt

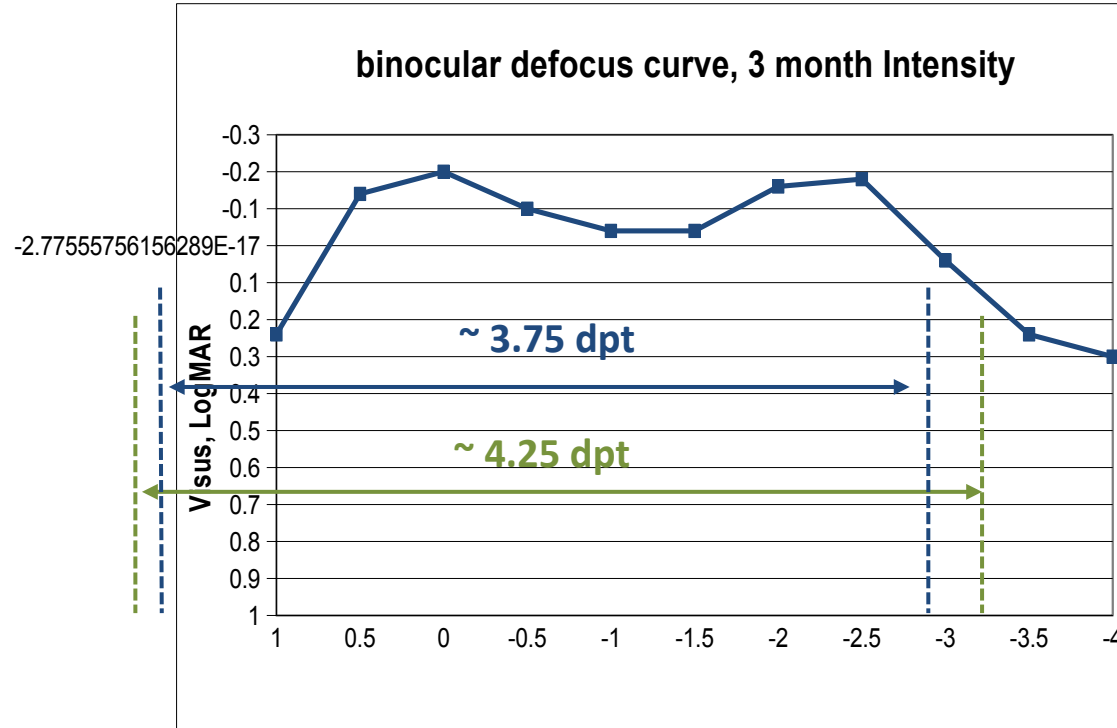
0.20 logMAR or better:
from +0.75 to -3.25 dpt



*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg



Case 1: Defocus curve: 3 month, binocular



Intensity bin

0.10 logMAR or better:
from +0.75 to -3.0 dpt

0.20 logMAR or better:
from +1 to -3.25 dpt



*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg

Case 2

Patient: 64y female patient

Presentation:

First presentation at our clinic for pre-cataract examination due to vision deterioration, L > R for about 1 year. The patient is severely disturbed by cloudy vision and extreme glare phenomena. Additionally, she reports monocular double vision in both eyes. Motivated for a trifocal IOL.

Medical History and Previous Findings:

Unremarkable, except for age-related cataract.

Subjective Refraction:

R: +1.50 / -0.50 / 95°

L: +2.25 / -0.25 / 88°

Visual Acuity with Correction:

R 1.0 / L 0.80

Organ Findings:

R/L: Non-irritated, normal, cataract with posterior capsular opacification.

OD				IOL-Berechnung				OS			
refr.				refr.				refr.			
Aspheric				Aspheric				Aspheric			
L: Final				L: Final				L: Final			
Tab: ---				Tab: ---				Tab: ---			
150°: Unastigmatic				150°: Unastigmatic				150°: Unastigmatic			
L: -0.40 dpt				L: -0.40 dpt				L: -0.40 dpt			
Corneal data				Corneal data				Corneal data			
AL: 24.50 mm	SA: 0.00	SL: 0.00	AS: 0.00	AL: 24.50 mm	SA: 0.00	SL: 0.00	AS: 0.00	AL: 24.50 mm	SA: 0.00	SL: 0.00	AS: 0.00
SR: 2.71 mm	SR: 0.00	SR: 0.00	SR: 0.00	SR: 2.71 mm	SR: 0.00	SR: 0.00	SR: 0.00	SR: 2.71 mm	SR: 0.00	SR: 0.00	SR: 0.00
IR: 0.24 mm	IR: 0.00	IR: 0.00	IR: 0.00	IR: 0.24 mm	IR: 0.00	IR: 0.00	IR: 0.00	IR: 0.24 mm	IR: 0.00	IR: 0.00	IR: 0.00
WAA: 12.8 mm	WAA: 0.00	WAA: 0.00	WAA: 0.00	WAA: 12.8 mm	WAA: 0.00	WAA: 0.00	WAA: 0.00	WAA: 12.8 mm	WAA: 0.00	WAA: 0.00	WAA: 0.00
SL: 8.74 mm	SL: 0.00	SL: 0.00	SL: 0.00	SL: 8.74 mm	SL: 0.00	SL: 0.00	SL: 0.00	SL: 8.74 mm	SL: 0.00	SL: 0.00	SL: 0.00
SR: 0.42 dpt @ 151°	SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.42 dpt @ 151°	SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.42 dpt @ 151°	SR: 0.00	SR: 0.00	SR: 0.00
TR: 0.75 mm	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.75 mm	TR: 0.00	TR: 0.00	TR: 0.00	TR: 0.75 mm	TR: 0.00	TR: 0.00	TR: 0.00
SR: -0.72 dpt @ 151°	SR: 0.00	SR: 0.00	SR: 0.00	SR: -0.72 dpt @ 151°	SR: 0.00	SR: 0.00	SR: 0.00	SR: -0.72 dpt @ 151°	SR: 0.00	SR: 0.00	SR: 0.00
Manual sphere intensity				Manual sphere intensity				Manual sphere intensity			
-1.50				-1.50				-1.50			
+0.00				+0.00				+0.00			
SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.00	SR: 0.00
+22.00	+0.00	+22.00	+0.00	+22.00	+0.00	+22.00	+0.00	+22.00	+0.00	+22.00	+0.00
+21.00	+0.00	+21.00	+0.00	+21.00	+0.00	+21.00	+0.00	+21.00	+0.00	+21.00	+0.00
+20.00	+0.00	+20.00	+0.00	+20.00	+0.00	+20.00	+0.00	+20.00	+0.00	+20.00	+0.00
+19.00	+0.00	+19.00	+0.00	+19.00	+0.00	+19.00	+0.00	+19.00	+0.00	+19.00	+0.00
+18.00	+0.00	+18.00	+0.00	+18.00	+0.00	+18.00	+0.00	+18.00	+0.00	+18.00	+0.00
+17.00	+0.00	+17.00	+0.00	+17.00	+0.00	+17.00	+0.00	+17.00	+0.00	+17.00	+0.00
+16.00	+0.00	+16.00	+0.00	+16.00	+0.00	+16.00	+0.00	+16.00	+0.00	+16.00	+0.00
+15.00	+0.00	+15.00	+0.00	+15.00	+0.00	+15.00	+0.00	+15.00	+0.00	+15.00	+0.00
+14.00	+0.00	+14.00	+0.00	+14.00	+0.00	+14.00	+0.00	+14.00	+0.00	+14.00	+0.00
+13.00	+0.00	+13.00	+0.00	+13.00	+0.00	+13.00	+0.00	+13.00	+0.00	+13.00	+0.00
+12.00	+0.00	+12.00	+0.00	+12.00	+0.00	+12.00	+0.00	+12.00	+0.00	+12.00	+0.00
+11.00	+0.00	+11.00	+0.00	+11.00	+0.00	+11.00	+0.00	+11.00	+0.00	+11.00	+0.00
+10.00	+0.00	+10.00	+0.00	+10.00	+0.00	+10.00	+0.00	+10.00	+0.00	+10.00	+0.00
+9.00	+0.00	+9.00	+0.00	+9.00	+0.00	+9.00	+0.00	+9.00	+0.00	+9.00	+0.00
+8.00	+0.00	+8.00	+0.00	+8.00	+0.00	+8.00	+0.00	+8.00	+0.00	+8.00	+0.00
+7.00	+0.00	+7.00	+0.00	+7.00	+0.00	+7.00	+0.00	+7.00	+0.00	+7.00	+0.00
+6.00	+0.00	+6.00	+0.00	+6.00	+0.00	+6.00	+0.00	+6.00	+0.00	+6.00	+0.00
+5.00	+0.00	+5.00	+0.00	+5.00	+0.00	+5.00	+0.00	+5.00	+0.00	+5.00	+0.00
+4.00	+0.00	+4.00	+0.00	+4.00	+0.00	+4.00	+0.00	+4.00	+0.00	+4.00	+0.00
+3.00	+0.00	+3.00	+0.00	+3.00	+0.00	+3.00	+0.00	+3.00	+0.00	+3.00	+0.00
+2.00	+0.00	+2.00	+0.00	+2.00	+0.00	+2.00	+0.00	+2.00	+0.00	+2.00	+0.00
+1.00	+0.00	+1.00	+0.00	+1.00	+0.00	+1.00	+0.00	+1.00	+0.00	+1.00	+0.00
0.00	+0.00	0.00	+0.00	0.00	+0.00	0.00	+0.00	0.00	+0.00	0.00	+0.00
-1.00	+0.00	-1.00	+0.00	-1.00	+0.00	-1.00	+0.00	-1.00	+0.00	-1.00	+0.00
-2.00	+0.00	-2.00	+0.00	-2.00	+0.00	-2.00	+0.00	-2.00	+0.00	-2.00	+0.00
-3.00	+0.00	-3.00	+0.00	-3.00	+0.00	-3.00	+0.00	-3.00	+0.00	-3.00	+0.00
-4.00	+0.00	-4.00	+0.00	-4.00	+0.00	-4.00	+0.00	-4.00	+0.00	-4.00	+0.00
-5.00	+0.00	-5.00	+0.00	-5.00	+0.00	-5.00	+0.00	-5.00	+0.00	-5.00	+0.00
-6.00	+0.00	-6.00	+0.00	-6.00	+0.00	-6.00	+0.00	-6.00	+0.00	-6.00	+0.00
-7.00	+0.00	-7.00	+0.00	-7.00	+0.00	-7.00	+0.00	-7.00	+0.00	-7.00	+0.00
-8.00	+0.00	-8.00	+0.00	-8.00	+0.00	-8.00	+0.00	-8.00	+0.00	-8.00	+0.00
-9.00	+0.00	-9.00	+0.00	-9.00	+0.00	-9.00	+0.00	-9.00	+0.00	-9.00	+0.00
-10.00	+0.00	-10.00	+0.00	-10.00	+0.00	-10.00	+0.00	-10.00	+0.00	-10.00	+0.00
-11.00	+0.00	-11.00	+0.00	-11.00	+0.00	-11.00	+0.00	-11.00	+0.00	-11.00	+0.00
-12.00	+0.00	-12.00	+0.00	-12.00	+0.00	-12.00	+0.00	-12.00	+0.00	-12.00	+0.00
-13.00	+0.00	-13.00	+0.00	-13.00	+0.00	-13.00	+0.00	-13.00	+0.00	-13.00	+0.00
-14.00	+0.00	-14.00	+0.00	-14.00	+0.00	-14.00	+0.00	-14.00	+0.00	-14.00	+0.00
-15.00	+0.00	-15.00	+0.00	-15.00	+0.00	-15.00	+0.00	-15.00	+0.00	-15.00	+0.00
-16.00	+0.00	-16.00	+0.00	-16.00	+0.00	-16.00	+0.00	-16.00	+0.00	-16.00	+0.00
-17.00	+0.00	-17.00	+0.00	-17.00	+0.00	-17.00	+0.00	-17.00	+0.00	-17.00	+0.00
-18.00	+0.00	-18.00	+0.00	-18.00	+0.00	-18.00	+0.00	-18.00	+0.00	-18.00	+0.00
-19.00	+0.00	-19.00	+0.00	-19.00	+0.00	-19.00	+0.00	-19.00	+0.00	-19.00	+0.00
-20.00	+0.00	-20.00	+0.00	-20.00	+0.00	-20.00	+0.00	-20.00	+0.00	-20.00	+0.00
-21.00	+0.00	-21.00	+0.00	-21.00	+0.00	-21.00	+0.00	-21.00	+0.00	-21.00	+0.00
-22.00	+0.00	-22.00	+0.00	-22.00	+0.00	-22.00	+0.00	-22.00	+0.00	-22.00	+0.00
-23.00	+0.00	-23.00	+0.00	-23.00	+0.00	-23.00	+0.00	-23.00	+0.00	-23.00	+0.00
-24.00	+0.00	-24.00	+0.00	-24.00	+0.00	-24.00	+0.00	-24.00	+0.00	-24.00	+0.00
-25.00	+0.00	-25.00	+0.00	-25.00	+0.00	-25.00	+0.00	-25.00	+0.00	-25.00	+0.00
-26.00	+0.00	-26.00	+0.00	-26.00	+0.00	-26.00	+0.00	-26.00	+0.00	-26.00	+0.00
-27.00	+0.00	-27.00	+0.00	-27.00	+0.00	-27.00	+0.00	-27.00	+0.00	-27.00	+0.00
-28.00	+0.00	-28.00	+0.00	-28.00	+0.00	-28.00	+0.00	-28.00	+0.00	-28.00	+0.00
-29.00	+0.00	-29.00	+0.00	-29.00	+0.00	-29.00	+0.00	-29.00	+0.00	-29.00	+0.00
-30.00	+0.00	-30.00	+0.00	-30.00	+0.00	-30.00	+0.00	-30.00	+0.00	-30.00	+0.00
-31.00	+0.00	-31.00	+0.00	-31.00	+0.00	-31.00	+0.00	-31.00	+0.00	-31.00	+0.00
-32.00	+0.00	-32.00	+0.00	-32.00	+0.00	-32.00	+0.00	-32.00	+0.00	-32.00	+0.00
-33.00	+0.00	-33.00	+0.00	-33.00	+0.00	-33.00	+0.00	-33.00	+0.00	-33.00	+0.00
-34.00	+0.00	-34.00	+0.00	-34.00	+0.00	-34.00	+0.00	-34.00	+0.00	-34.00	+0.00
-35.00	+0.00	-35.00	+0.00	-35.00	+0.00	-35.00	+0.00	-35.00	+0.00	-35.00	+0.00
-36.00	+0.00	-36.00	+0.00	-36.00	+0.00	-36.00	+0.00	-36.00	+0.00	-36.00	+0.00
-37.00	+0.00	-37.00	+0.00	-37.00	+0.00	-37.00	+0.00	-37.00	+0.00	-37.00	+0.00
-38.00	+0.00	-38.00	+0.00	-38.00	+0.00	-38.00	+0.00	-38.00	+0.00	-38.00	+0.00
-39.00	+0.00	-39.00	+0.00	-39.00	+0.00	-39.00	+0.00	-39.00	+0.00	-39.00	+0.00
-40.00	+0.00	-40.00	+0.00	-40.00	+0.00	-40.00	+0.00	-40.00	+0.00	-40.00	+0.00
-41.00	+0.00	-41.00	+0.00	-41.00	+0.00	-41.00	+0.00	-41.00	+0.00	-41.00	+0.00
-42.00	+0.00	-42.00	+0.00	-42.00	+0.00	-42.00	+0.00	-42.00	+0.00	-42.00	+0.00
-43.00	+0.00	-43.00	+0.00	-43.00	+0.00	-43.00	+0.00	-43.00	+0.00	-43.00	+0.00
-44.00	+0.00	-44.00	+0.00	-44.00	+0.00	-44.00	+0.00	-44.00	+0.00	-44.00	+0.00
-45.00	+0.00	-45.00	+0.00	-45.00	+0.00	-45.00	+0.00	-45.00	+0.00	-45.00	+0.00
-46.00	+0.00	-46.00	+0.00	-46.00	+0.00	-46.00	+0.00	-46.00	+0.00	-46.00	+0.00
-47.00	+0.00	-47.00	+0.00	-47.00	+0.00	-47.00	+0.00	-47.00	+0.00	-47.00	+0.00
-48.00	+0.00	-48.00	+0.00	-48.00	+0.00	-48.00	+0.00	-48.00	+0.00	-48.00	+0.00
-49.00	+0.00	-49.00	+0.00	-49.00	+0.00	-49.00	+0.00	-49.00	+0.00	-49.00	+0.00
-50.00	+0.00	-50.00	+0.00	-50.00	+0.00	-50.00	+0.00	-50.00	+0.00	-50.00	+0.00
-51.00	+0.00	-51.00	+0.00	-51.00	+0.00	-51.00	+0.00	-51.00	+0.00	-51.00	+0.00



Case 2: 3 months Post-OP

The patient is satisfied and would repeat the procedure.

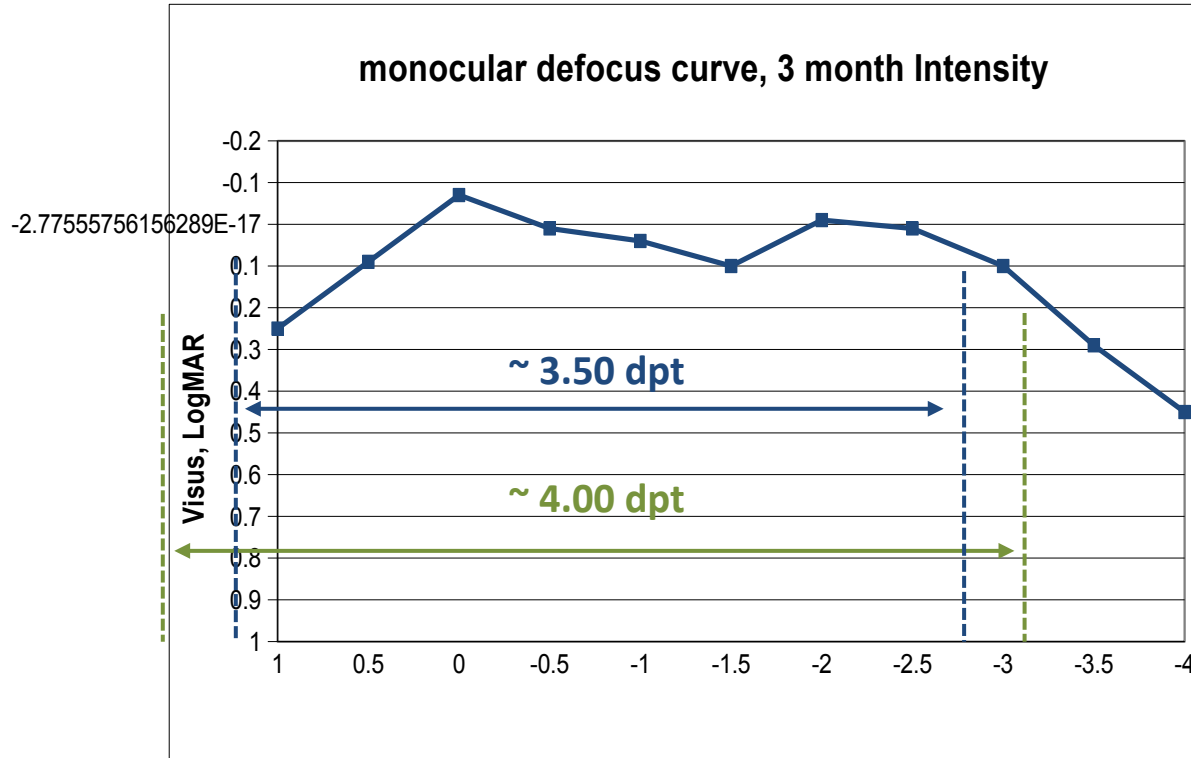
Halo and glare are moderately pronounced, some issues with night vision, but no other difficulties in daily life.

Organ Findings:

R/L: Normal pseudophakia

	OD	OS	OU
Subjective Ref.	0 / -0.75 / 110°	0 / -0.25 / 65°	
UDVA 4 m (logMAR)	-0.04	-0.08	-0.08
CDVA 4 m	-0.08	-0.10	-0.10
UIVA 80 cm	0.02	0.02	-0.06
DCIVA 80 cm	-0.02	-0.04	-0.08
UNVA 40 cm	-0.06	-0.06	-0.08
DCNVA 40 cm	-0.06	-0.06	-0.08

Case 2: Defocus curve: 3 months, monocular



Intensity mono

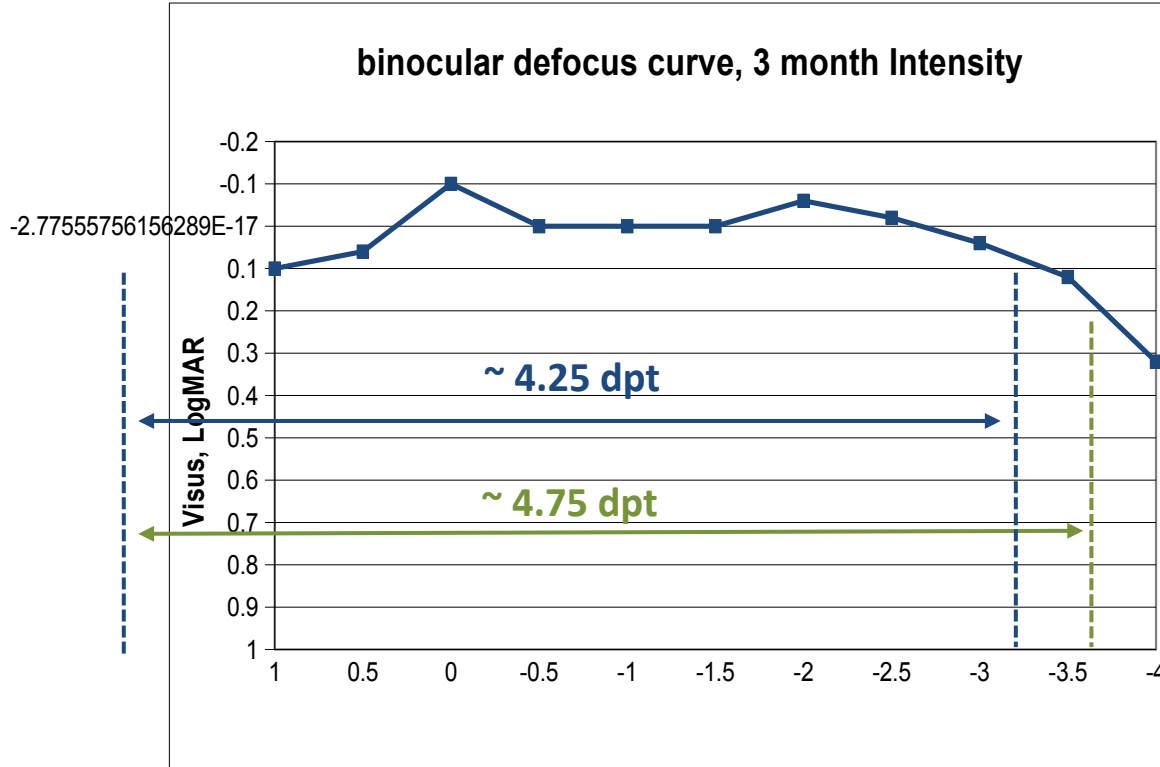
0.10 logMAR or better:
from +0.5 to -3.0 dpt

0.20 logMAR or better:
from +0.75 to -3.25 dpt



*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg

Case 2: Defocus curve: 3 months, binocular



Intensity bin

0.10 logMAR or better:
from +1.0 to -3.25 dpt

0.20 logMAR or better:
from +1 to -3.75 dpt



*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg

Patient: 84y male patient

Presentation:

First presentation at our clinic for pre-cataract examination due to vision deterioration, R>L for about 1 year.
Motivated for a trifocal IOL

Medical History and Previous Findings:

Unremarkable, except for age-related cataract.

Subjective Refraction:

R: -1.25 / -1.25 / 115°

L: 0 / -0.75 / 70°

Visual Acuity with Correction:

R: 0.50 / L: 0.80

Organ Findings:

R/L: Non-irritated, age-appropriate, cataract with cortical nuclear opacification (Cat. corticonuclearis).

OD Order		ITE - Berechnung		OS Order	
Incision on steep axis		Incision on steep axis			
LX: Phak		LX: Phak			
LX: ---		LX: ---			
LX: 11.00 mm (0.00 dpt)		LX: 11.00 mm (0.00 dpt)			
LX: 11.00 mm (0.00 dpt)		LX: 11.00 mm (0.00 dpt)			
LX: Phak		LX: Phak			
LX: ---		LX: ---			
LX: 11.00 mm (0.00 dpt)		LX: 11.00 mm (0.00 dpt)			
LX: 11.00 mm (0.00 dpt)		LX: 11.00 mm (0.00 dpt)			
LX: Phak		LX: Phak			
LX: ---		LX: ---			
LX: 11.00 mm (0.00 dpt)		LX: 11.00 mm (0.00 dpt)			
LX: 11.00 mm (0.00 dpt)		LX: 11.00 mm (0.00 dpt)			
LX: Phak		LX: Phak			
LX: ---		LX: ---			
LX: 11.00 mm (0.00 dpt)		LX: 11.00 mm (0.00 dpt)			
LX: 11.00 mm (0.00 dpt)		LX: 11.00 mm (0.00 dpt)			
LX: Phak		LX: Phak			
LX: ---		LX: ---			
LX: 11.00 mm (0.00 dpt)		LX: 11.00 mm (0.00 dpt)			
LX: 11.00 mm (0.00 dpt)		LX: 11.00 mm (0.00 dpt)			
LX: Phak		LX: Phak			
LX: ---		LX: ---			
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Case 3: 3 months postop

The patient is satisfied and would repeat the procedure.

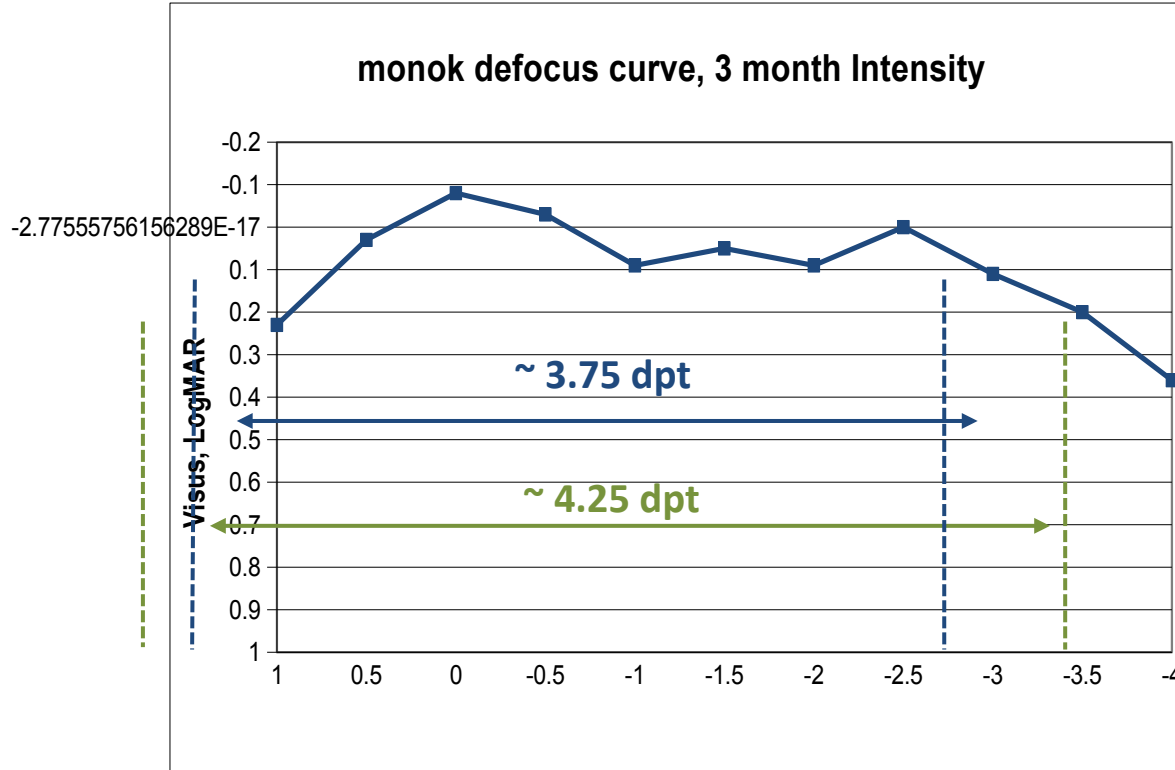
No Halo and glare, no issues with night vision.

Organ Findings:

R/L: Normal pseudophakia

	OD	OS	OU
Subjective Ref.	0 / 0 / 0°	0 / 0 / 0°	
UDVA 4 m (logMAR)	-0.10	-0.08	-0.10
CDVA 4 m	-0.10	-0.08	-0.10
UIVA 80 cm	0.06	0.04	-0.02
DCIVA 80 cm	0.06	0.04	-0.02
UNVA 40 cm	-0.02	-0.06	-0.06
DCNVA 40 cm	-0.02	-0.06	-0.06

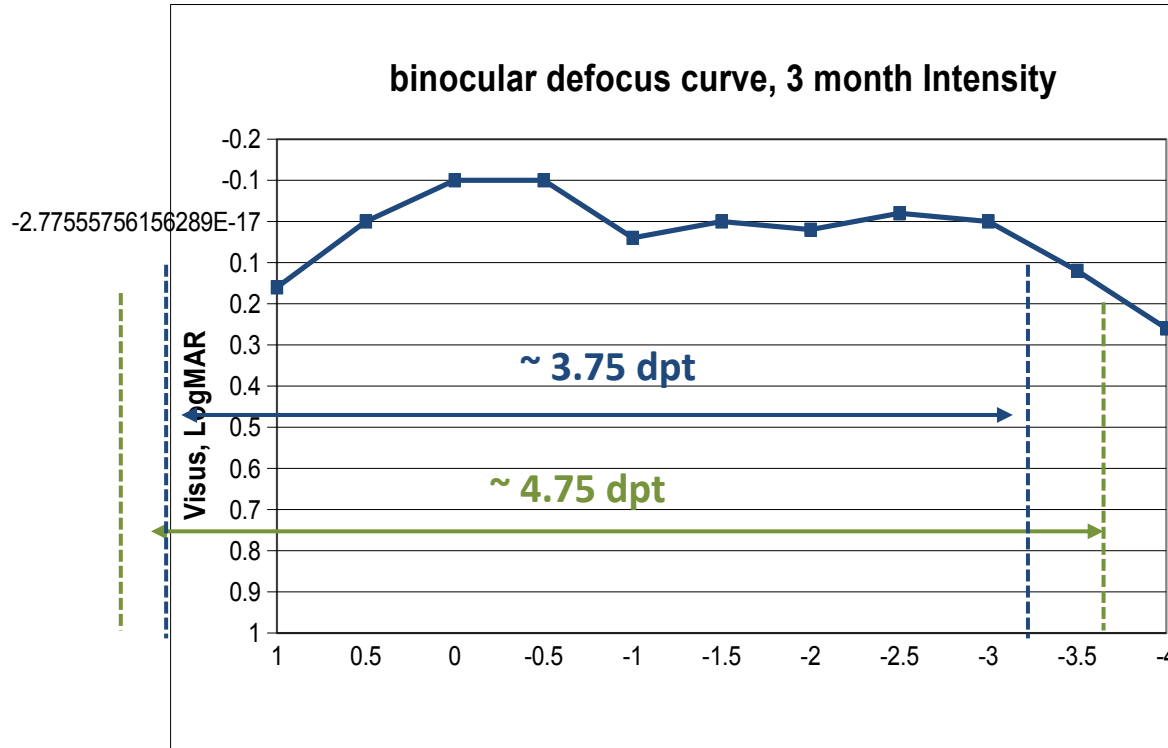
Case 3: Defocus curve, 3 months, monocular



*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg



Case 3: Defocus curve, 3 months, binocular



Intensity bin

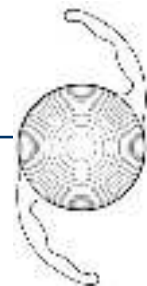
0.10 logMAR or better:
from +0.75 to -3.0 dpt

0.20 logMAR or better:
from +1 to -3.75 dpt



*Data on file: International Vision Correction Research Center (IVCRC), Universitäts-Augenklinik Heidelberg

Conclusions: Hanita Intensity Trifocal IOL*



- Very good results for uncorrected and distance corrected visual acuity testing at far, intermediate and near distance
- Results confirmed by defocus curve testing: visual acuity of 0.0 -0.1 logMAR (1.0-0.8 decimal) or better from +1 to -2.75 diopters
- Excellent defocussing curves binocular
- Minimal loss of light (6.5% intensity)
- Rapid neuroadaptation
- High levels of patient satisfaction



*Data on file: International Vision Correction Research Center (IVCRC), University Eye Clinic Heidelberg, Germany



**Steinbeis-Forschungszentrum
The David J Apple Center
for Vision Research**



IVCRC.net
International Vision Correction
Research Center Network