CE
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Optiflex GENESIS

NATURAL YELLOW

ASPHERIC HYDROPHOBIC
NATURAL YELLOW IOL

EXPERIENCE
VISUAL
BRILLIANCE

GLISTENING FREE · GLISTENING FREE ·
MICS Compatible

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A breakthrough in hydrophobic IOL technology - NO GLISTENING

- Controlled surgical manipulation
- Enhanced bio-adhesion
- Increased bio-mechanical stability
- Excellent folding & unfolding
- No Fluid exchange with Aqueous Humor
- Resistant to environmental stress or environmental conditions like temperature, humidity & contamination and hence reduced risks of inflammation.

Glistening: A material characteristic in today's Hydrophobic Acrylic IOLs [20-29]

Glistening is fluid-filled microvacuoles within the optic when the IOL is in an aqueous environment. Temperature changes are considered primary factor for glistening as shown in several studies of the mechanism and causative factors of glistening.

Glistening scatter light and cause:

- Significant reduction in light transmission through the lens
- Reduced Modulation Transfer Function (MTF) of the IOL
- Reduced contrast sensitivity, and increased halos & glare sensitivity

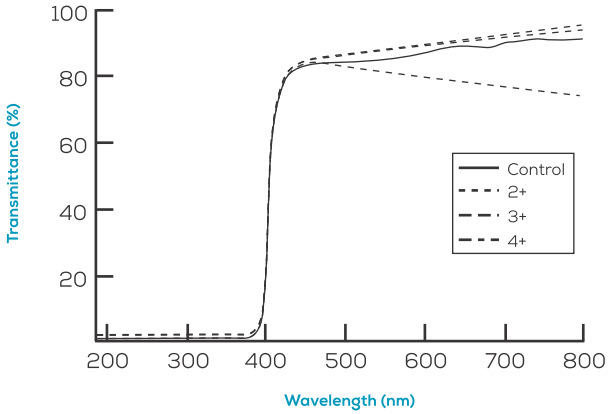


Figure 1:
Spectral transmission with Glistening level (control to Level 4+)

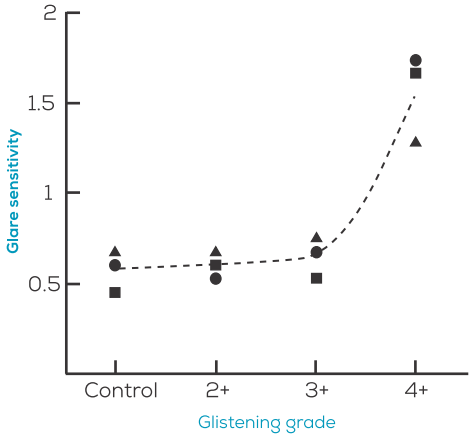


Figure 2:
Glare sensitivity index evaluated by ophthalmologists
The line indicates the average value

Technological Excellence:

Optiflex GENESIS natural yellow IOLs are optimally hydrated hydrophobic intraocular lenses. The equilibrium water content is achieved through pre-hydration of the lens material.

- Retains all hydrophobic material characteristics
- Stabilizes IOL material against temperature and environmental changes
- No aqueous changes in IOL material once implanted in the eye –"GLISTENING FREE" IOL.

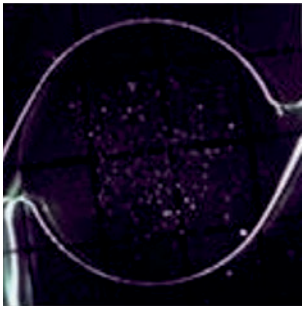


Figure 3:

Image of competitor IOL product with glistening (Grade 1 on Miyata Scale)

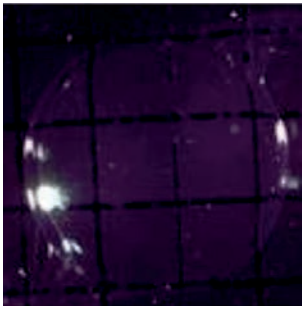


Figure 4:

Image of Glistening-free Biotech Hydrophobic IOL (Grade 0 on Miyata Scale)

Glistening Study Results [30]

Biotech hydrophobic IOLs demonstrate a very low level of glistening formation, not only in the central area (0.74 + 0.54 MVs/mm2) but also in five different peripheral areas of the IOL (0.52 + 0.24 MVs/mm2). The amount of glistening generated within this IOL correlates to the Miyata Scale zero. Therefore, this lens can be considered as glistening-free.

In comparison, IOL from the competition, formed a larger amount of glistening for both the central area (41.8 + 27.7 MVs/mm2) and the peripheral areas (19.9 + 10.6 MVs/mm2) of the optic and is therefore, classified as grade one on the Miyata Scale.

Violet-Blue Light Filter: An optimal solution for Retina protection [17-19]

Optiflex GENESIS IOLs contain a unique covalently bound natural yellow Chromophore, which contains the same UV-A blocking and Violet-Blue Light filtering Chromophore that is in the human crystalline lens. We use nature's own solution to the problem of protecting the Retina from harmful energetic light. The absorption spectrum of 3 Hydroxy Kynurenine (Figure 5) shows that this natural compound is an excellent UV-A blocker with a secondary purpose of filtering Violet-Blue Light. This compound and it's Beta Glucoside derivatives are nature's primary protection for UV-A and Violet-Blue Light.

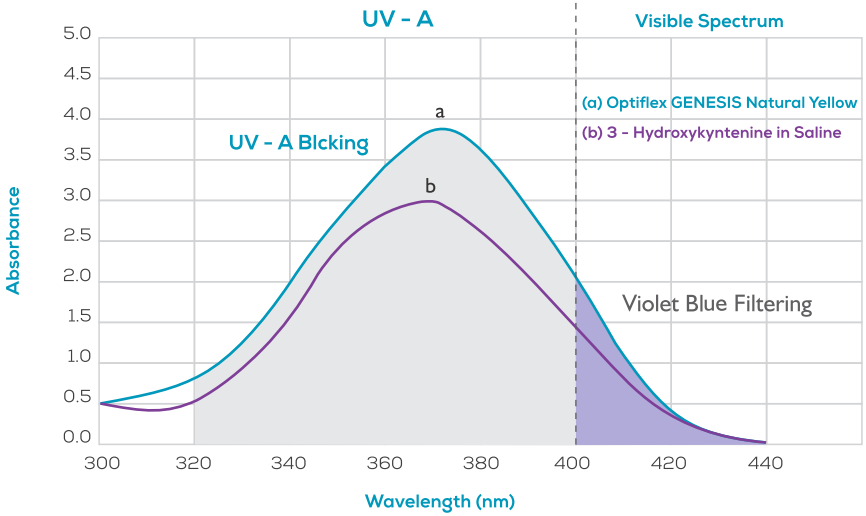


Figure 5:

Comparison of 3-Hydroxy Kynurenine in Saline versus Optiflex GENESIS Natural Yellow IOL

Thus, Optiflex GENESIS natural yellow IOLs provide Violet-Blue light filtering similar to a young natural crystalline lens and without altering color perception & contrast sensitivity

Improvement in Scotopic Vision [14-16]

Scotopic vision is the vision of the eye under low light conditions. In the human eye, cone cells are nonfunctional in low light. Scotopic vision is produced exclusively through rod cells which are most sensitive to wavelengths of light around 498 nm (Green-Blue). The below mentioned graph shows that the quality of the scotopic vision is at its peak for the visible spectrum ranging from 450 nm to 550 nm. The quality of scotopic vision decreases by filtering healthy Blue Light of 440 nm to 500 nm. Whereas, Optiflex GENESIS IOLs through its unique Natural Yellow Chromophore filters 400 nm to 440 nm of Violet-Blue Light spectrum only, not to affect the quality of Scotopic vision.

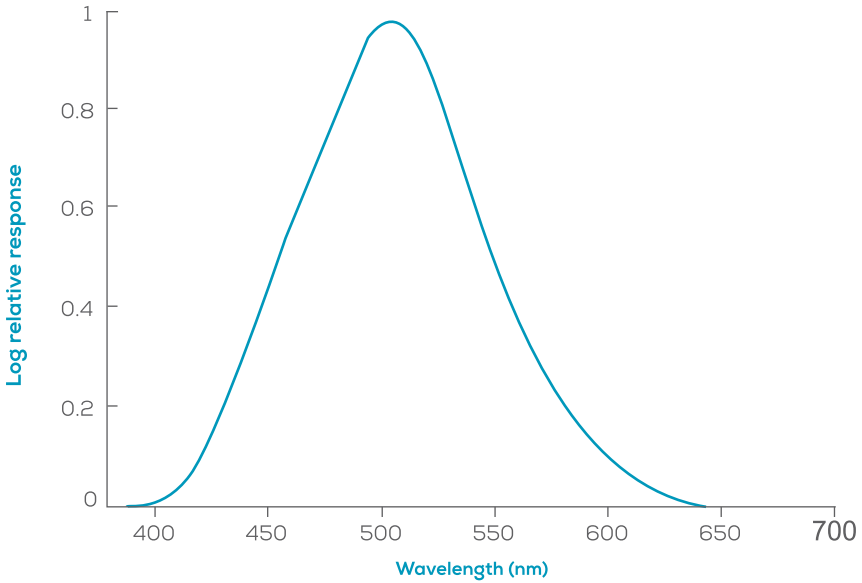


Figure 6:

The CIE 1951 scotopicluminosity function. The horizontal axis is wavelength in nm.

Circadian Rhythm [01-05]

- In humans, Melatonin is produced by the Pineal Gland, a small endocrine gland located in the center of the brain but outside the blood-brain barrier. The Melatonin signal forms part of the system that regulates the sleep-wake cycle by chemically causing drowsiness and lowering the body temperature
- Production of Melatonin by the Pineal Gland is inhibited by light to the Retina and permitted by darkness. Its onset each evening is called the Dim-Light Melatonin Onset (DLMO)
- It is principally Blue Light, between 460 to 480 nm, that suppresses Melatonin, proportional to the light intensity and length of exposure
- By filtering Blue Light ranging up to 500 nm, secretion of Melatonin increases & ultimately disturbs the Circadian Rhythm
- Biotech uses Natural Yellow Hydrophobic material from Benz Research & Development (US Patent 7,947,796) to manufacture Optiflex GENESIS natural yellow lenses which blocks UV-A & filters Violet-Blue spectrum of light ranging from 400nm to 440 nm and doesn't affect Circadian Rhythm

Chromatic Aberration: Relation with ABBE No. [06-13]

ABBE No. is the significance of the Chromatic Aberration which could rise by the material used to manufacture the IOL.

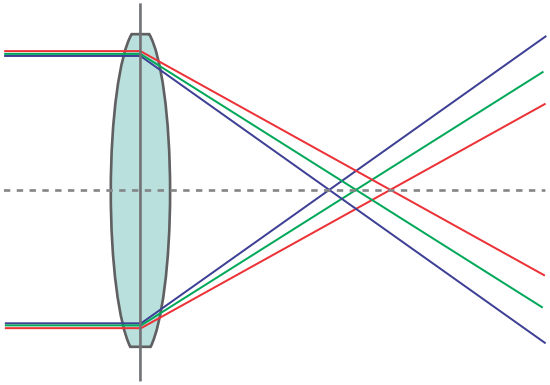


Figure 7: Chromatic Aberration results through IOL material having low ABBE No.

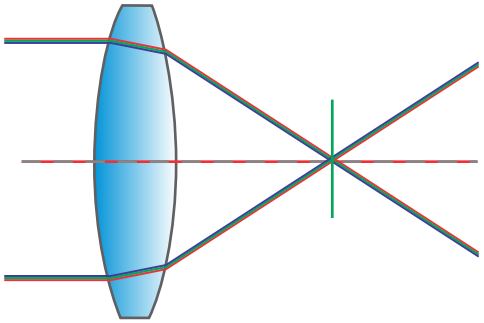


Figure 8: Reduced Chromatic Aberration through IOL material having higher ABBE No.

Optiflex GENESIS IOLs are manufactured using Natural Yellow Hydrophobic material having ABBE No. of 47. This results in the decreased amount of Chromatic Aberration & provides excellent visual outcomes postoperatively.

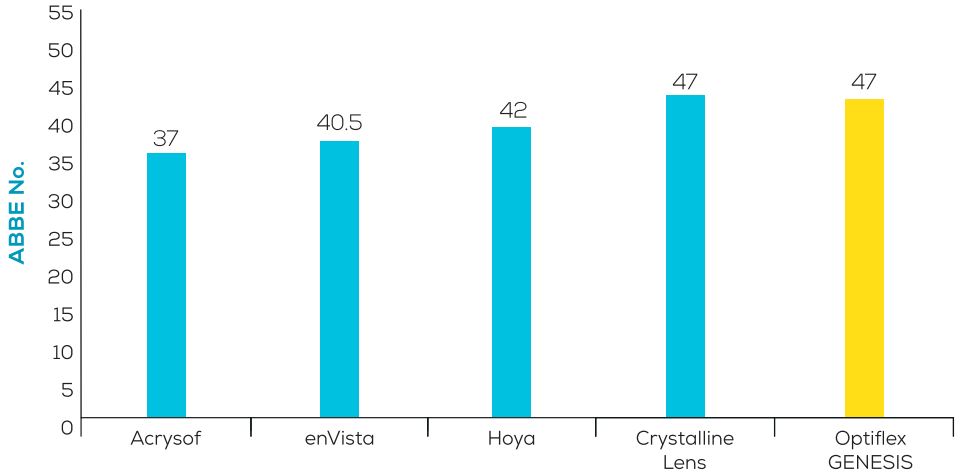


Figure 9: High ABBE No. indicates low degree of Chromatic Aberration

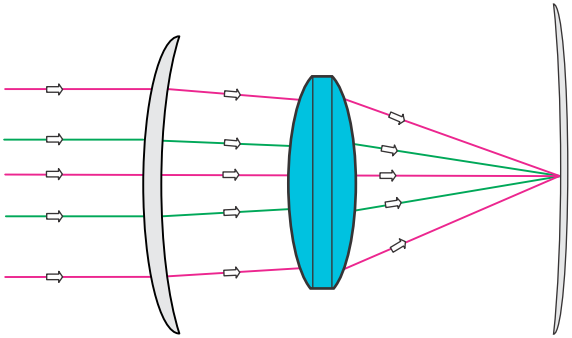


Figure 10:
Aspheric IOLs with negative S.A.

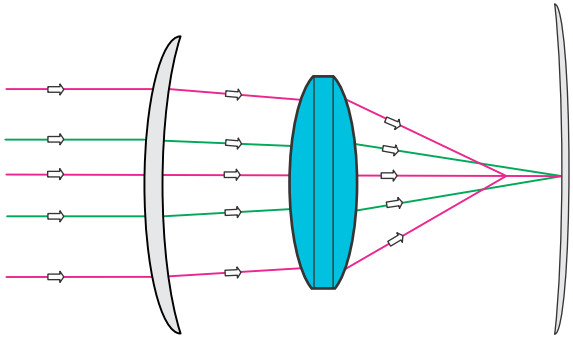
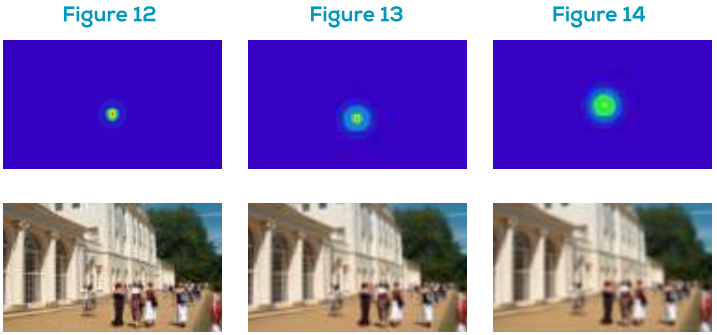


Figure 11:
Conventional Spherical IOLs with positive S.A.

Features:

- Negative Spherical Aberration to compensate Positive Spherical Aberration of the Cornea
- 360° Advanced Square Edge
- Enhances Contrast Sensitivity, Sharpness & Clarity at night
- Smooth lens surface reduces bacterial adhesion & inflammatory cell response
- Enhanced functional outcomes in Mesopic & Scotopic lighting conditions
- Less sensitive to tilt & decentration

Figure 12, 13, 14: The simulated point spread function and image in the eye on Retinal plane with Negative Spherical Aberration IOL (Fig. 12), with Zero Spherical Aberration IOL (Fig. 13), and with Conventional Spherical IOL (Fig. 14)



SPECIFICATIONS

Model	MFA6		
Material	Hydrophobic Acrylic containing Natural Yellow Chromophore		
Water Content	< 5 %		
Optic Type	Biconvex, Single Piece, 360° Square Edge with Aspheric Optic		
Near Addition	N.A.		
Optic Size	6.00 mm		
Overall Size	13.00 mm		
Angulation	0°		
ACD	5.28		
In Site Refractive Index	1.52		
Estimated A-Constant	118.5		
Recommend Optical A-Constants	SRK - T: 118.76	SRK - II: 119.10	Holl. 1 Const. SF: 1.58
	HOFFER-Q ACD: 5.37	HAIGIS: a0: 1.58, a1: 0.400, a2: 0.100	
Diopter Range	+ 5.0 D to + 30.0 D (with 0.5 D step)		
Sterilization	Irradiation		
Indication	Phacoemulsification		
Implantation Site	Capsular Bag		

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BIOTECH EUROPE MEDITECH INC. LIMITED | Unit AF 2, IDA Business & Technology Park,

Gallowstown, Co Roscommon, F42 P862, IRELAND. | Email: intlsales@biotechhealthcare.com | www.biotechhealthcare.com