essilor evolving vision

PRESS KIT

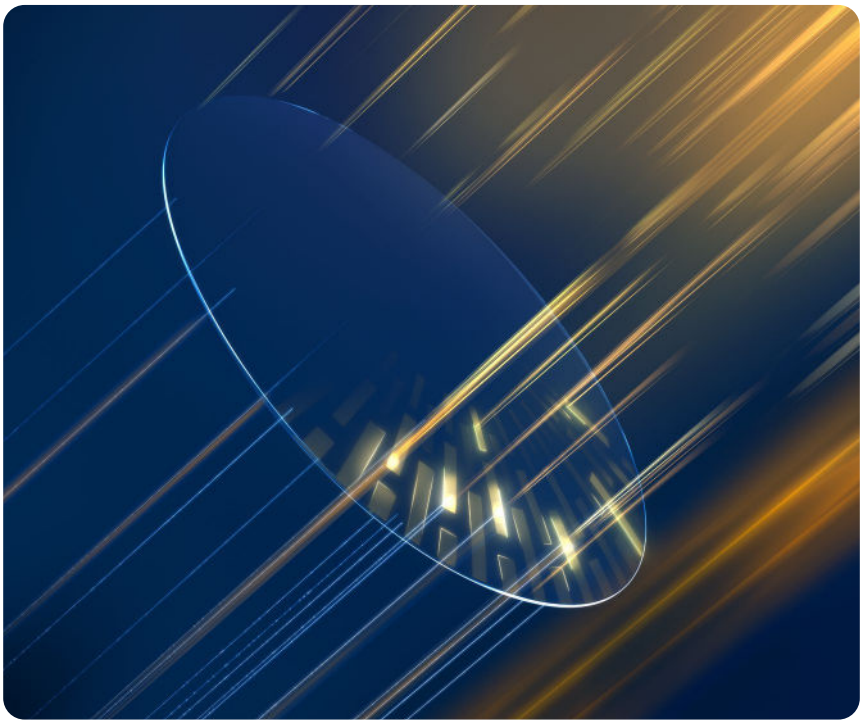
ESSILOR ANNOUNCES LATEST PROGRESSIVE LENS INNOVATION: VARILUX® PHYSIO® EXTENSEE™ LENS

Essilor® presents its first Varilux® lens developed using a dynamic replica of the human pupil to offer high vision intensity in any light for extra visual sharpness and contrast[1].

Powered by Varilux® lens AI twinning technology and pupil-variation predicting, the Varilux® Physio® extensee™ lens is designed to provide optimized correction for each wearer's pupil dynamics to reduce high-order aberrations and offer extra visual sharpness and contrast[1].

The pupil is dynamic, constantly adapts to new lighting conditions, its ability to change size and adapt to light is unique to each individual. Most progressive lenses are designed based on the wearer's pupil size remaining constant in all lighting situations, but this can be problematic and negatively impact vision. Indeed, even the most satisfied progressive lens wearers complain about a drop in visual performance in various lighting environments:

39% are very interested in corrective lenses designed to improve their vision comfort regardless of light intensity[2].

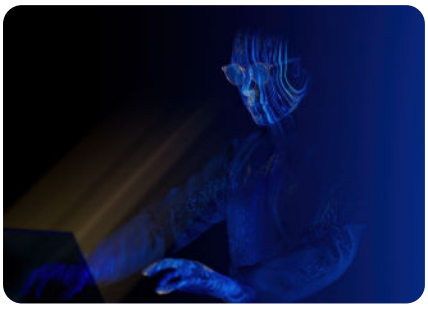


Sébastien Fricker, Vision and Perception Modelling Team Manager at EssilorLuxottica said: *"When the size of the pupil increases, the light beam entering the eye crosses a bigger portion of the lens. As a result, it can contain more high-order aberrations and induce a loss in image quality.*

"Therefore, accounting for pupil-size variation in lens design is key for maximizing contrast perception and visual performance for wearers."

NEW
Varilux®
Physio® extensee™

TECHNOLOGICAL ADVANCES

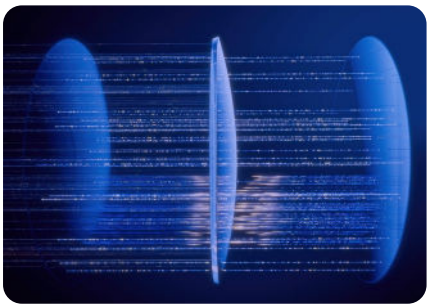


Pupilizer™

Only recently have vision scientists been able to derive a model which considers the main parameters that influence pupil size[3]. The result is a state-of-the-art dynamic pupil model that integrates multiple studies and datasets to describe and detail pupil size variations.

Enriched for the first time by this comprehensive dynamic pupil model, Varilux® AI twinning technology replicates thousands of wearer profiles, performing multiple tasks at all distances, in different light conditions. It then analyses this powerful data to predict wearers' pupil size variation, resulting in Pupilizer™ lens technology.

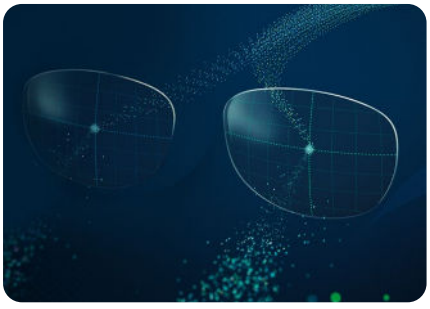
Thanks to pupil-variation prediction, Pupilizer™ lens technology is built into the Varilux® Physio® extensee™ lens to reduce high-order aberrations and minimise distortion when light passes the lens. By associating a prescription to a predicted pupil dynamism profile, the lens can be produced to closely match the wearer's daily, real-life pupil variations.



Dual Booster™

Close-up vision is one of the major pain points for progressive lens wearers, with 41% reporting have difficulty reading fine print[2]. Dual Booster™ lens surfacing technology is designed to optimize near vision. Varilux® Physio® extensee™ is a dual-sided lens, carefully engineered between the back and front surfaces to provide a magnification effect in the near vision zone ; without impacting the aesthetic of the lens or the overall progressive power.

This dual surface provides a high quality of vision at near to aid with tasks such as reading fine print.



Synchroneyes®

The management of binocular vision in Varilux® Physio® extensee™ lens is enhanced thanks to integrating the Synchroneyes® lens technology.

This balances the left and right lenses' designs to match power distributions and patterns of unwanted astigmatism, and allows for a wider field of vision.

NEW
Varilux®
Physio® extensee™

WEARERS FEEDBACK

A real-life consumer study carried out by an independent institute on 79 progressive lens wearers equipped with Varilux® Physio® extensee™ lenses in their daily lives showed that:

94%

experienced high vision intensity in any light[1].

92%

felt confident in low light conditions[1].

96%

experienced a high quality of vision at near[4].

AI simulations were also performed using twinning technology to compare the performance of the Varilux® Physio® extensee™ lens compared to similar lenses on the market and showed a **25% enhancement in contrast and sharpness in all light conditions, even in low light[5].**

LENTI SIMILI PRESENTI SUL MERCATO

VARILUX® PHYSIO® EXTENSEE™ LENSES

NEW
Varilux®
Physio® extensee™

NEAR VISION BEHAVIOR

As 9/10 people have a unique near vision behaviour[6], Varilux® Physio® extensee™ lenses can now include Near Vision Behaviour measurement. It personalizes the near vision zone by adjusting its position and size.

of wearers easily accessed the near vision zone[7]

of wearers experienced extra comfortable vision during a long task in near vision[7]

EXPERT Q&A

Experts from EssilorLuxottica answer some questions on the new lens and how it can benefit wearers.

How does Varilux® Physio® extensee™ lens improve vision quality across various light environments?

Sébastien Fricker, Vision and Perception Modelling Team Manager at EssilorLuxottica, said: *"Today there is still a pain point amongst progressive lens wearers, with our recent consumer study revealing that 39% are very interested in corrective lenses designed to improve their vision comfort regardless of light intensity.*[2]

"It was therefore evident that we should continue addressing this issue and with our fourth generation of Varilux® Physio® lens, we are now able to take advantage of improved calculations and design capability to create a better lens to help manage low light conditions.

"Thanks to AI twinning technology, pupil size variations can be predicted for each wearer and during the design of this Pupilizer™ lens technology we not only considered low light conditions but a whole range of environments to find the best surface to provide optimal vision at all times."

Can you simplify how the lens works for wearers?

Sébastien Fricker said: *"When the pupil is behind a progressive lens it can be prone to high-order aberrations, which are optical defects that lead to vision being less sharp. When the pupil is small in bright light these defects are negligible but the bigger the pupil gets in lower light settings, the more these high-order aberrations will have an impact on vision quality. This affects contrast sensitivity which is the ability to see differences in shades of the same colour ; and sharpness which is the ability to distinguish the fine details of an object."*

IMAGE REFERENCE

CONTRAST DEGRADATION

SHARPNESS DEGRADATION

"However, during the design of Varilux® Physio® extensee™ lens, our R&D team used the pupil-variation modelling in the digital twin, which is a virtual wearer that can simulate a real person in daily life."

"With this extra data, AI simulations were carried out by the digital twin based on wearers of different ages, in different light environments from dim to bright light and in-between, at different distances, performing different tasks. Using all this data we were able to create Pupilizer™ lens technology and modify the shape of the lens to reduce these optical defects caused by low light."

How is the pupil model used to personalise the lens?

Sébastien Fricker said: *"The pupil size is related to four parameters which have the most impact. One is age and as we grow older our pupil size decreases. The others are related to the environment including the brightness, proximity and the size of the object being viewed."*

"The data from the pupil-variation modelling is fed into our digital twin allowing us to personalise the optical lens even further. When the lab receives a patient's prescription, they will incorporate the pupil dynamic profile as part of the lens calculation to optimise and build the lens."

How does the latest technology meet the needs of today's presbyopes?

Meena Puar, Global Medical Advisor - Presbyopia at EssilorLuxottica, said: *"Presbyopia, a condition that impairs near vision, tends to worsen over time, with the challenges increasing as the severity of the condition progresses. These near vision tasks are typically more challenging if the lighting is not optimal, which can affect contrast and sharpness. In modern day scenarios, today's presbyopes are seeking high quality vision across all lighting environments throughout the day.*

"To prescribe the latest lens technologies is an opportunity to address the evolving needs of presbyopic patients. The Varilux® Physio® extensee™ lens is designed to cater to a wide range of presbyopes. It incorporates an innovative dynamic pupil model, which takes the pupil size into account in different lighting conditions and across various distances."

NEW Varilux® Physio® extensee™

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About Essilor®

Essilor®, part of EssilorLuxottica's portfolio, is a leader in eyeglass lenses worldwide[8] and the number one lens brand recommended by eye care professionals (ECP)[9]. It offers a complete range of solutions dedicated to each individual's vision and lifestyle needs throughout their life. Every Essilor® lens is a combination of multiple complementary technologies thanks to its suite of leading premium vision care solutions, including innovative brands such as Stellest®, Eyezen® and Varilux® and Crizal®. These groundbreaking technologies correct vision, protect eyes from UV rays and enhance visual clarity.

References

1. Varilux® Physio® extensee™ – in-real life consumer study - Eurosyn – 2024 – France (n=79 progressive lens wearers)

2. Essilor International - Vision Care Usage and Attitudes - CN/FR/US - June Marketing - 2023 (n=10 611 respondents). • 39% : Analysis based on 481 (45-65 yo PAL wearers) • 41% : Analysis based on 1 350 (45-65 yo PAL wearers)

3. Zapata-Díaz, Juan F., Hema Radhakrishnan, W. Neil Charman, and Norberto López-Gil. (2019). Accommodation and Age-Dependent Eye Model Based on in Vivo Measurements. Journal of Optometry, 12(no. 1), 3–13.

4. Varilux® Physio® extensee™ – in-real life consumer study - Eurosyn – 2024 – France (n=60 progressive lens wearers)

5. Simulations vs relevant progressive lens products - done with AI twinning technology during activities in near vision in various luminance – Comparison between mean's value based on several prescriptions & materials - Internal R&D simulations – 2024

6. EssilorLuxottica R&D analysis of near vision behavior data from 160k orders, at least one parameter out of four of visual behavior differs from the average

7. Varilux® Physio® extensee™ track – in-real life consumer study - Eurosyn – 2024 – France (n=57 progressive lens wearers).

8. Euromonitor, Eyewear 2023 edition; Essilor International company; worldwide retail value sales at RSP.

9. Quantitative research conducted among a representative sample of 958 independent ECPs by CSA in February 2019 – France, the UK, Germany, Italy, Spain, the US, Canada, Brazil, China, India.