New Varilux Comfort®

Technical Paper and Wearer Studies

Five comparative wearer studies evaluate New Varilux Comfort® lenses in clinical and real-world situations.

New Varilux Comfort® Lenses

The visual demands of contemporary life challenge our eyes in ways they have never been challenged before. Over the last two decades, screens providing all kinds of digital information have become a universal part of life: we work at computers, we text on cell phones, we rely on GPS devices to guide us. Compared to 1990, the world is suddenly full of screens.

For people over 40, this new visual environment demands progressive lenses that can meet new challenges. Recently, Varilux Comfort®, the world's most popular progressive addition lens (PAL), was reengineered for optimized performance in a visual environment dominated by new technologies for reading, communicating, and working.

The results are striking.

A New Lens for a New World

New Varilux Comfort® lenses retain all the features that made the original Varilux Comfort® lens so popular but improve upon the original design in three key ways: 1) the progression has been shortened for easier access to the near zone, 2) the distance and near zones have been widened for increased visual comfort during daily activities, and 3) reduced astigmatism in the intermediate zone reduces swim and speeds adaptation (Figures 1 and 2).

FIGURE 1 Both the distance and near vision zones are wider in the New Varilux Comfort® design, allowing wearers to more easily use peripheral vision for visual multitasking.

The following studies will demonstrate how New Varilux Comfort lenses meet the needs of many different patients, including: patients new to PALs, those satisfied with their current Varilux Comfort lenses, and those who are currently wearing other PAL designs. For example, in a study comparing the performance of New Varilux Comfort and the original Varilux Comfort, subjects preferred New Varilux Comfort lenses 3:1 for changing focus between zones. In numerous wearer tests, 100% of subjects readily adapted to New Varilux Comfort lenses regardless of their previous form of correction.

An added advantage of the shorter progression length of New Varilux Comfort lenses is a shorter minimum fitting

FIGURE 2 Astigmatism in the intermediate zone of the New Varilux Comfort® lens has been reduced, providing markedly less swim and improved dynamic vision.

height (17 mm), which provides patients with greater options in frame selection (Figure 3). Patients who select even smaller frames will benefit from the specially designed New Varilux Comfort Short™ lenses, which can be fit down to a minimum height of 14 mm.

Both New Varilux Comfort and New Varilux Comfort Short lenses are also available as digitally surfaced designs. New Varilux Comfort DRx™ lenses are specifically compensated for placement on the back side of the lens.

New Varilux Comfort Enhanced™ lenses offer the eyecare practitioner a new level of performance. All Varilux Enhanced lenses use the DualOptix™ format which distributes progressive design elements on both surfaces of the lens. By utilizing both surfaces to create the design, Varilux engineers are able to simultaneously improve focus and minimize distortion to levels not possible in single surface design formats (i.e., traditional or back side). DualOptix lenses are also customized to the wearer's visual requirements.

The Evolution of Varilux Comfort: 1994-2010

When Essilor introduced Varilux Comfort in 1994, the television was the only screen that most people viewed daily for any length of time. Back then, visual activities—driving, reading, watching television and movies—were of longer duration and required people to switch distance fields less often. However, over the past decade, the swift emergence and proliferation of mobile devices and wide flat-screen televisions and computers has created an entirely new set of visual demands.

Today's progressive lens wearer needs to be able to switch between visual fields frequently and quickly, spending less time at each visual distance, sometimes to the point of visual multitasking. For example, a progressive lens wearer might text or read e-mails while grocery shopping. Eyecare providers are charged with the task of helping PAL wearers keep pace with a complex, demanding, and rapidly changing visual world. Introduced in 2010, New Varilux Comfort lenses help practitioners meet this challenge.

Science-driven Technology

New Varilux Comfort lenses were developed using rigorous scientific methodology and state of the art optical technology to assess vision not only with an eye chart, but in a dynamic "real world" environment. As part of Essilor's proprietary Live Optics™ process, Body Head Eye Movement (BoHEM) technology enables researchers to capture how lens wearers move their heads, bodies, and eyes in response to the type of visual stimuli they encounter every day (Figure 4). The BoHEM is a mobile system which is capable of analyzing head and eye movements during routine activities. For example, the system revealed wearers rely heavily on peripheral vision when using

FIGURE 3 The New Varilux Comfort® lenses (right) are available with a shorter fitting height—17 mm. Original Varilux Comfort® lenses had a MFH of 18 mm (left).

mobile phones. The BoHEM system allowed Essilor engineers to pinpoint exactly where the original design of Varilux Comfort lenses needed updating and made immeasurable contributions to the development of New Varilux Comfort lenses.

The Live Optics process, through which new optical designs move from the laboratory to human testing and then back to the laboratory, culminated in wearer tests of New Varilux Comfort lenses using double-blind, randomized methodology.

Wearer Tests Support New Varilux Comfort

Data from wearer studies confirm that New Varilux Comfort lenses improve not only progressive lens performance, but also patient satisfaction. This publication highlights five pivotal studies sponsored by Essilor and conducted by independent eyecare practitioners and researchers. These studies reflect the real-world lens utilization patterns and patient preference issues that practitioners encounter in daily practice. In each comparative study, patients preferred New Varilux Comfort lenses over both the original Varilux Comfort and competing progressive lenses.

FIGURE 4 The Body Head Eye Movement System (BoHEM) consists of a motion-sensing helmet, rucksack, and spectacles. Body and eye movements in response to controlled stimuli are tracked and analyzed, allowing researchers to gain a comprehensive understanding of wearer's posture and direction of gaze.

Patient satisfaction is key to the success of any PAL. In a survey assessing wearer satisfaction with New Varilux Comfort lenses in seven countries worldwide (the U.S. accounted for 44% of the 445 survey participants), the response of wearers was overwhelmingly positive (95%) in favor of New Varilux Comfort. Up to 93% observed New Varilux Comfort lenses provided a wider field of vision than their previous correction, and 89% would recommend these lenses to others.[1] Most importantly, 84% of participants reported that with New Varilux Comfort lenses they saw clearly when changing fields from distance to near vision. This represents a major benchmark for progressive lens design—and a vital parameter in the new visual world.

Will Original Comfort Wearers Adapt?

Around the world, eyecare practitioners have provided over 100 million pair of original Varilux Comfort lenses to their patients. The extremely forgiving nature of the design has generated intense loyalty from both practitioners and their patients, so it was crucial to confirm that patients who are currently wearing Varilux Comfort lenses would seamlessly upgrade to New Varilux Comfort lenses. A double-blind, randomized study of thirty wearers was developed to compare the performance of Varilux Comfort and New Varilux Comfort lenses.

With respect to transitioning between zones, wearers who expressed a preference preferred New Varilux Comfort lenses 3:1 for switching between distance and near zones and 2:1 for switching between intermediate and near zones.[2] Overall, wearers preferred the performance of New Varilux Comfort lenses 4:1 over the original design ($P = 0.02$). The study's findings provided researchers with a high level of confidence that patients will embrace New Varilux Comfort lenses. According to this study, New Varilux Comfort lenses provide a measureable improvement over the original design across a typical population—even wearers who are totally satisfied with Varilux Comfort like New Varilux Comfort more!

New Varilux Comfort® vs the Competition

A series of three studies compared New Varilux Comfort lenses to various competitive PALs. In every study, New Varilux Comfort lenses outperformed the competitive products. All of the comparative lenses in these studies were high-end, general use PALs, and each study incorporated a double-masked, non-dispensing, randomized protocol to eliminate bias on the part of either the subject or the examiner. Evaluations involved both real-life simulations and standardized office evaluations. The majority of subjects enrolled in these trials were experienced PAL wearers, although some were transitioning from single vision (for either distance or near) or contact lenses.

The first of these studies compared the performance of traditionally surfaced New Varilux Comfort lenses against a competitor's traditionally surfaced PAL design (TSPAL, introduced in 2001). Of the 30 subjects enrolled, 20 were experienced PAL wearers. New Varilux Comfort lenses significantly outperformed TSPAL lenses in near visual quality, extent of vertical field, and overall wearer preference.[3] In terms of distance visual width, subjects preferred New Varilux Comfort lenses 2:1 over the TSPAL lenses.

New Varilux Comfort® vs a Digitally Surfaced Back Side Progressive

In a second wearer comparison to a competitor, 100% of subjects with a preference preferred New Varilux Comfort lenses over a back-side digitally surfaced progressive introduced in 2007 (FBS).[4] New Varilux Comfort lenses were significantly preferred for ease of changing focus, extent of vertical field, near visual quality, and reading zone access. In real-life simulation evaluations, subjects preferred the New Varilux Comfort 2:1 over the FBS.

In the third study, New Varilux Comfort lenses were compared to back-side digitally surfaced "high-definition" lenses (FBSHD). The competitive design claimed to provide "polyvalence" for multiple activities, but in real life simulations, subjects preferred New Varilux Comfort lenses more than 2:1 for intermediate vision and more than 4:1 for near vision. Subjects preferred New Varilux Comfort lenses more than 2:1 for width of distance fields and more than 3:1 for extent of vertical field.[5]

Most importantly, wearer studies support wearer preference for New Varilux Comfort lenses in the measures that matter most in the contemporary visual world—width of visual field (near and distance) and ease of transition between focal zones. Additionally, wearers had no problems adapting to New Varilux Comfort lenses regardless of whether they were currently wearing original Varilux Comfort lenses, other progressive designs, or even contact lenses and near-vision only reading glasses.

A Varilux Portfolio of High-quality Lenses

To give dispensers flexibility to precisely meet patient needs, New Varilux Comfort lenses are available in several versions: New Varilux Comfort, New Varilux Comfort DRx™, New Varilux Comfort Short™, New Varilux Comfort Short DRx™, and New Varilux Comfort Enhanced™.

New Varilux Comfort lenses improve upon Varilux Comfort lenses in three user-friendly ways. First, the near and distance areas are up to 25% wider for relaxed vision in all daily activities. Second, the progression length is 1 mm shorter for easier access to the reading area. Third, there is less astigmatism in the intermediate zone for even less swim and easier adaptation.

New Varilux Comfort Short lenses give patients the option of choosing more stylish frames down to a minimum fitting height of 14 mm. In terms of performance,

New Varilux Comfort Short lenses have three main advantages over Varilux Ellipse: up to 24% more distance area, a 141° distance angle for wider fields of view, and a shorter progression length.

New Varilux Comfort Enhanced lenses are the top of the Total Comfort Vision platform (which is comprised of all New Varilux Comfort lens products). These lenses are customized through the DualOptix digital process and provide all the benefits of New Varilux Comfort lenses, customized to the wearer's ametropia and ADD power. These include: additional width of clear vision in all zones, less peripheral distortion for better side-to-side viewing, and customized fitting heights starting at 14 mm, which enable the fitting of these lenses in smaller frames.

Recommendations for Practitioners

For eyecare providers, New Varilux Comfort progressive lenses provide an opportunity to increase patient satisfaction by providing high-performing eyewear. With their wider near and distance zones, reduced peripheral distortion, and shorter progression, New Varilux Comfort lenses raise the design and performance standard for PALs.

New Varilux Comfort lenses perform so well because they are specifically designed to meet the visual needs of the contemporary world. These lenses allow wearers' eyes to quickly move between a larger environment and screens of all sizes at all distances. In doing so, these lenses meet the challenge of helping wearers keep up with modern life in a world of increasingly complex visual demands.

In addition to visual performance, New Varilux Comfort lenses support today's modern frame fashions, with designs such as New Varilux Comfort Short and New Varilux Comfort Enhanced—both of which can easily fit small, stylish frames; so patients can get the vision they want in a frame they love. And perhaps best of all, no matter what kind of correction patients wore before, all will quickly adapt to their New Varilux Comfort lenses.

Eyecare practitioners who understand the optical improvements of these products are in a position to help presbyopic patients choose optimal lenses to correct their vision. Now more than ever before, practitioners can select PALs that fit a patient's needs for ease of transition, maximum field width, and distance area. Both new and experienced PAL wearers find New Varilux Comfort lenses provide them with a level of visual acuity and function that makes it easier for them to thrive in the new visual environment.

REFERENCES

1. Essilor. New Varilux Comfort® — Wearer Study.
2. Essilor. New Varilux Comfort® vs Varilux Comfort® — A Comparative Study.
3. Essilor. New Varilux Comfort® vs Traditionally Surfaced PAL (TSPAL) — A Comparative Study.
4. Essilor. New Varilux Comfort® vs Full Back Side PAL (FBS) — A Comparative Study.
5. Essilor. New Varilux Comfort® vs Full Back Side "High Definition" PAL (FBSHD) — A Comparative Study.

A Changing Visual Landscape

In 1994, when the original Varilux Comfort® lenses were introduced, the visual landscape for presbyopes was far less challenging than it has become today. In the past, visually-demanding activities were generally limited to driving, reading, watching television, and working at a personal computer. Varilux Comfort® lenses were designed to meet the needs of that environment by helping presbyopes adapt naturally to the postures and viewing angles imposed by these activities—the key element being that when these patients read, watched TV, or worked at a computer, they did so without having to frequently change focus.

A modern presbyope's visual world is very different: today's presbyope has to contend with frequent and rapid visual shifts. In addition to the ubiquitous desktop computer, we are now confronted with the tiny screens of MP3 players, GPS devices, and credit card payment devices.

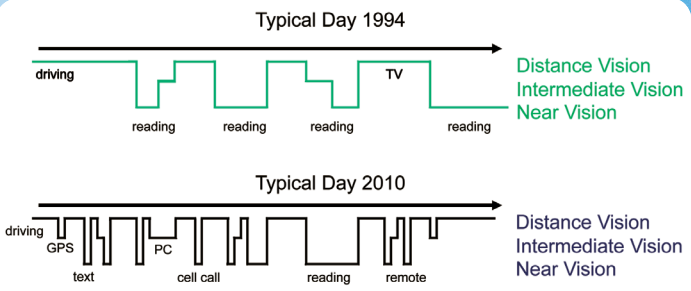


FIGURE 1 Compare the frequency of transition between visual fields in 1994 and 2010. A typical day in 2010 involves more switching, less time at each visual distance, and more time using devices in the intermediate distance.

Most problematic is the smart phone, which plays multiple roles in contemporary life (Figure 1). The size and resolution of the screens on these devices make each of them visually taxing, and difficulties increase as a user moves quickly from one modality to another.

Efficient use of multiple small-screen devices requires that the gaze move quickly through several different parts of the lens. In order to make the way as smooth as possible for presbyopes, New Varilux Comfort® lenses are specifically adapted for a world of visual multitasking.

New Varilux Comfort®
— International Wearer Assessment

PURPOSE

To assess the satisfaction with New Varilux Comfort® lenses by wearers from different countries in real market conditions.

METHODS

Wearer satisfaction survey: Initial questionnaire to collect patient history and prescription.

Satisfaction survey (completed by patient and reviewed with practitioner after 3 weeks of wear).

Assessment of New Varilux Comfort & comparison vs. previous form of correction:

- Overall quality of vision
- Quality of distance vision
- Quality of intermediate vision
- Quality of near vision
- Width of distance vision
- Width of intermediate vision
- Width of near vision
- Dynamic vision (during motion of subject)
- Ease of access to near vision
- Overall visual comfort
- Speed of adaptation
- Ease of adaptation

Subjects were also asked if they would recommend New Varilux Comfort to friends/family.

At the conclusion of the study, practitioners were surveyed regarding their impressions of New Varilux Comfort.

All subjects paid normal retail price for their eyewear.

All lenses had Crizal® anti-reflective surfaces.

All lenses were clear 1.50 or Airwear®.

SUBJECTS

N = 445 subjects at 123 practitioner locations

Rx Range –4.25 to +3.50

Sphere	>–1.00	–1.00 to +1.00	>+1.00
Subjects	103	169	173

Cylinder 0.00 to –2.00; ADD +1.25 to +3.00

ADD	<+2.00	+2.00 to +2.50	>+2.50
Subjects	94	289	62

Previous Correction

	PALs	Other
Subjects	75%	24%

FINDINGS

95% of subjects had a very positive evaluation of their overall vision with New Varilux Comfort.

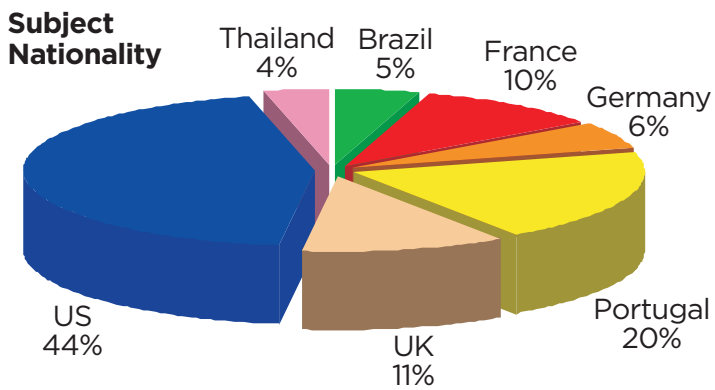
% Subjects with Positive Evaluation	
Overall quality of vision	**95%**
Distance vision	**96%**
Intermediate vision	**90%**
Near vision	**93%**
Dynamic vision (subject moving)	**91%**
Dynamic vision (object moving)	**91%**

The majority of subjects found the performance of New Varilux Comfort to be "clearly better" compared to their previous correction.

% Subjects ranking performance of New Varilux Comfort as "clearly better"	
Distance vision	**64%**
Intermediate vision	**66%**
Near vision	**69%**
Dynamic vision (subject moving)	**58%**
Dynamic vision (object moving)	**59%**

Up to 93% of subjects experienced equivalent or wider fields of vision with New Varilux Comfort compared to their previous form of correction.

% Subjects ranking fields of vision as "equivalent to clearly wider" with New Varilux Comfort	
Distance vision	**93%**
Intermediate vision	**89%**
Near vision	**84%**



CONCLUSIONS

- Up to 93% of subjects indicate New Varilux Comfort provides wider fields of vision vs previous correction.
- 89% of subjects would recommend New Varilux Comfort lenses to others.
- 84% of subjects see clearly and instantly when changing from distance to near vision.

New Varilux Comfort lenses provide high levels of satisfaction in real life wear.

New Varilux Comfort® vs Full Back Side "High Definition" PAL — A Comparative Study

PURPOSE

To compare the performance of two PAL design formats:

1. New Varilux Comfort® — traditional format, general-use PAL introduced in 2010 providing quick access to near with a smooth periphery
2. An "HD" FBS version of a general-use PAL providing "polyvalence" for multiple activities

METHODS

Double-masked, non-dispensing, randomized

Fitting parameters:

- Monocular Pds
- FRP at center pupil
- Min. fitting height = 17 mm
- Min. 10 mm between FRP and superior edge of lens

Testing parameters:

Standard lighting (100cd/m^2)

Tested activites:

- **Real-Life Simulation**
  Distance vision (scrolling text on LCD TVs)
  Intermediate vision (typing text to monitor from easel)
  Near vision (menu)
  Dynamic vision — subject moving (stairs)
- **Standardized Evaluations**
  Subjective width at distance (column target)
  Subjective width at intermediate and near (standard charts)
  Subjective visual quality at intermediate and near (standard charts)
  Ease of changing focus
  Ease of near vision access

SUBJECTS

N = 30 subjects

Rx Range –6.75 to +3.25

Sphere	>–1.00	–1.00 to +1.00	>+1.00
Subjects	15	7	8

Cylinder 0.00 to –2.00 (median = –0.87)**; ADD +1.25 to +3.00**

ADD	<+2.00	+2.00 to +2.50	>+2.50
Subjects	14	15	1

Previous Correction

	PALs	DVO/NVO	CLs
Subjects	19	6	5

Research conducted by an independent third party —
sponsored by Essilor of America

FINDINGS

The study produced two statistically significant findings,** and four findings which approached significance.*

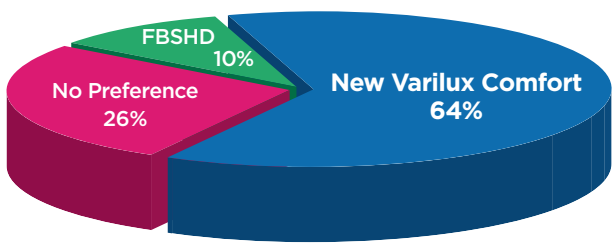
STANDARDIZED EVALUATIONS

	New Varilux Comfort	FBSHD	NP	*p*-value
Distance width*	16	7	7	***0.09***
Intermediate width (60cm)	8	5	17	*0.58*
Int. visual quality (60cm)	8	6	16	*0.79*
Near width (40cm)	7	9	14	*0.80*
Near visual quality (40cm)	10	7	13	*0.63*
Extent vertical field* (intermediate to near)	13	4	13	***0.05***
Reading zone access**	19	7	4	***0.03***
Locating text (distance to near)	11	4	15	*0.12*
Ease of changing focus	10	8	12	*0.81*

REAL-LIFE SIMULATION

	New Varilux Comfort	FBSHD	NP	*p*-value
Distance vision (TVs)	9	5	16	*0.42*
Intermediate vision (typing)*	14	5	11	***0.07***
Near vision (menu)*	9	2	19	***0.07***
Dynamic vision (stairs)	8	7	15	*1.00*
OVERALL PREFERENCE**	**19**	**3**	**8**	***<0.01***

Overall Preference



CONCLUSIONS

- 86% of subjects with a clear overall preference preferred New Varilux Comfort over the comparison PAL (73% of all subjects expressed a preference)
- New Varilux Comfort was significantly preferred for "access to the reading area."
- In standardized tests, subjects with a preference preferred New Varilux Comfort:
  - Distance width **> 2 to 1**
  - Extent of vertical field **> 3 to 1**
- In real-life simulations, subjects with a preference preferred New Varilux Comfort:
  - Intermediate vision **> 2 to 1**
  - Near vision **> 4 to 1**

The findings show New Varilux Comfort provides easier access to near vision and better overall vision.

New Varilux Comfort® vs Full Back Side PAL — A Comparative Study

PURPOSE

To compare the performance of two PAL design formats:

1. New Varilux Comfort® — traditional format, general-use PAL introduced in 2010 providing quick access to near with a smooth periphery
2. Full back-side, general-use PAL introduced in 2007

METHODS

Double-masked, non-dispensing, randomized.

Fitting parameters:

- Monocular Pds
- FRP at center pupil
- Minimum fitting height = 19 mm
- Minimum 10 mm between FRP & superior edge of lens

Testing parameters:

Standard lighting (100cd/m^2)

Tested activites:

- **Standardized Evaluations**
  Ease of focus at near (menu)
  Subjective near width at 40 cm (standard chart)
  Subjective visual quality at near (standard chart)
  Ease of changing focus—near to distance
  Extent of vertical field (intermediate to near)
  Overall preference
- **Real Life Simulation**
  Global preference based on simulated distance, intermediate, near, change of focus, and adaptation

Identical frames and fitting parameters for each subject. All lenses were 1.50 index plastic with scratch-resistant coating.

SUBJECTS

N = 30 subjects; Age = 45 to 65 years (average = 53.7)

Rx Range –4.75 to +2.50

Sphere	>–1.00	–1.00 to +1.00	>+1.00
Subjects	12	10	8

Cylinder 0.00 to –2.00 (median = –0.68)**; ADD +1.25 to +2.50**

ADD	<+2.00	+2.00 to +2.50	>+2.50
Subjects	12	18	0

Previous Correction

	PALs	DVO/NVO	CLs
Subjects	21	4	5

No subject was currently wearing either design.

Research conducted by an independent third party —
sponsored by Essilor of America

FINDINGS

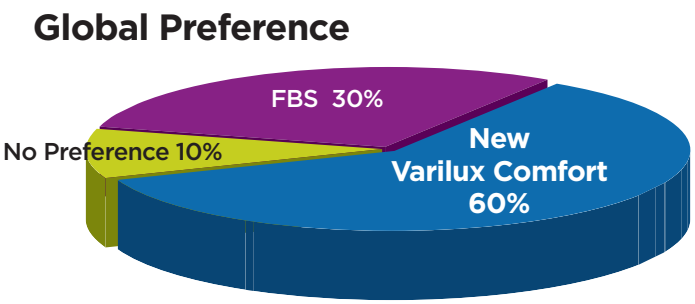
The study produced five statistically significant findings.**

STANDARDIZED EVALUATIONS

	New Varilux Comfort	FBS	NP	*p*-value
Ease of changing focus (near to distance)**	18	2	10	***<0.01***
Extent vertical field (Intermediate to near)**	25	2	3	***<0.01***
Near width (40cm)	12	5	13	*0.15*
Near visual quality (40cm)**	26	0	4	***0.00***
Reading zone access (menu)**	22	4	4	***<0.01***

REAL-LIFE SIMULATION

	New Varilux Comfort	FBS	NP	*p*-value
Global Preference	18	9	3	*0.12*
OVERALL PREFERENCE**	**26**	**0**	**4**	***0.00***



CONCLUSIONS

- 100% of subjects with a clear overall preference preferred New Varilux Comfort over the comparison PAL (87% of all subjects expressed a preference)
- New Varilux Comfort was significantly preferred for:
  - Ease of changing focus
  - Extent of vertical field
  - Near visual quality
  - Reading zone access
- In real-life simulation evaluations, subjects preferred New Varilux Comfort **2 to 1**

The findings indicate New Varilux Comfort provides easier access to near vision and better overall vision.

New Varilux Comfort® vs Traditionally Surfaced PAL — A Comparative Study

PURPOSE

To compare the performance of two PAL design formats:

1. New Varilux Comfort® — traditional format, general-use PAL introduced in 2010 providing quick access to near with a smooth periphery
2. Traditionally-surfaced — general-use PAL introduced in 2001

METHODS

Double-masked, non-dispensing, randomized

Fitting parameters:

- Monocular Pds
- FRP at center pupil
- Min. fitting height = 18 mm
- Min. 10 mm between FRP and superior edge of lens

Testing parameters:

Standard lighting (100cd/m^2)

Tested activites:

- **Standardized Evaluations**
  Distance visual quality (standard chart)
  Subjective visual quality at near (standard chart)
  Extent of vertical field (intermediate to near)
  Ease of changing focus (distance to near)
  Overall preference

Identical frames and fitting parameters for each subject. All lenses were 1.50 index plastic with scratch-resistant coating.

SUBJECTS

N = 30 subjects; Age = 45 to 64 years (average = 52.8)

Rx Range –6.75 to +3.00 (average = –1.40 D)

Sphere	>–1.00	–1.00 to +1.00	>+1.00
Subjects	16	7	7

Cylinder 0.00 to –2.00 (median = –0.63)**;**
ADD +0.75 to +2.50 (average = +1.88)

ADD	<+2.00	+2.00 to +2.50	>+2.50
Subjects	13	17	0

Previous Correction

	PALs	DVO/NVO	CLs
Subjects	20	5	5

Fitting Height Range = 18-28 mm (average = 21 mm)
No subject was currently wearing either design.

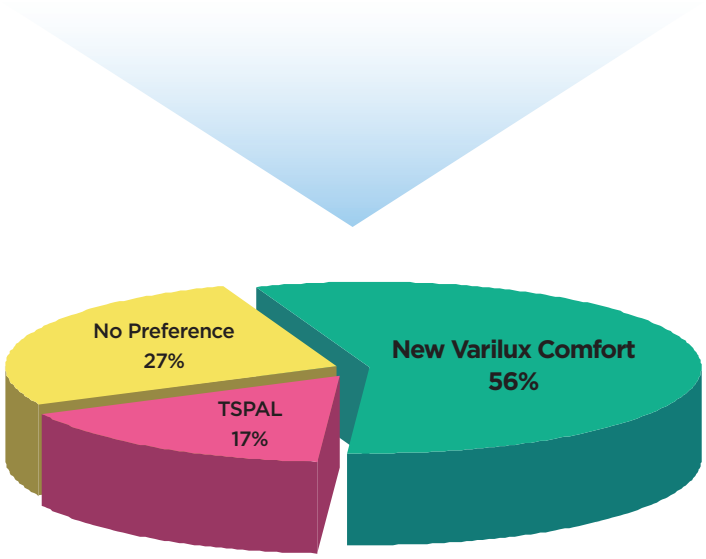
Research conducted by an independent third party —
sponsored by Essilor of America

FINDINGS

The study produced three statistically significant findings.**

STANDARDIZED EVALUATIONS

	New Varilux Comfort	TSPAL	NP	*p*-value
Distance visual width	16	8	6	*0.15*
Near visual quality**	16	4	10	***0.01***
Extent vertical field (Intermediate to near)**	12	3	15	***0.04***
Ease of changing focus (distance to near)	10	6	14	*0.45*
OVERALL PREFERENCE**	**17**	**5**	**8**	***0.02***



CONCLUSIONS

- **77% of subjects with a clear overall preference preferred New Varilux Comfort over the comparison PAL (73% of all subjects expressed a preference)**
- New Varilux Comfort was significantly preferred for:
  - Near visual quality
  - Extent of vertical field
  - Overall preference
- For distance visual width, New Varilux Comfort was preferred **2 to 1**

The findings indicate New Varilux Comfort provides superior near and overall vision.

New Varilux Comfort® vs Varilux Comfort® — A Comparative Study

PURPOSE

To test the validity of the claim that New Varilux Comfort® lenses (launched in 2010) provide easier access to near vision compared to the original Varilux Comfort design (launched in the US in 1994).

METHODS

Double-masked, non-dispensing, randomized

Fitting parameters:

- Monocular Pds
- FRP at center pupil
- Min. fitting height = 18 mm
- Min. 10 mm between FRP and superior edge of lens

Testing parameters:

Standard lighting (100cd/m^2)

Tested activites:

Standardized Evaluation

Change of focus between zones:

Visual Distance	Target
4 m+	Chart
60 cm	LCD monitor
35-40 cm	Medicine bottle/ nutrition info on package

Distance targets placed centrally — intermediate and near targets placed centrally and peripherally.

Each subject's overall preference was also recorded.

SUBJECTS

N = 30 subjects

Rx Range –6.75 to +3.25

Sphere	>–1.00	–1.00 to +1.00	>+1.00
Subjects	17	4	9

Cylinder 0.00 to –2.00 (median = –0.75)**;**
ADD +0.75 to +2.50

ADD	<+2.00	+2.00 to +2.50	>+2.50
Subjects	11	18	1

Previous Correction

	PALs	DVO/NVO	CLs
Subjects	18	5	7

Fitting Height Range = 18-28 mm (average = 21 mm).
All subjects were refracted within the past 12 months and had BVAs of 20/25 or better in each eye. Preference during recruitment was given to experienced PAL wearers.

Research conducted by an independent third party —
sponsored by Essilor of America

FINDINGS

Among those with a clear preference, subjects preferred New Varilux Comfort for changing focus between zones:

Between Distance & Near **3:1 preference**

Between Intermediate & Near **>2:1 preference**

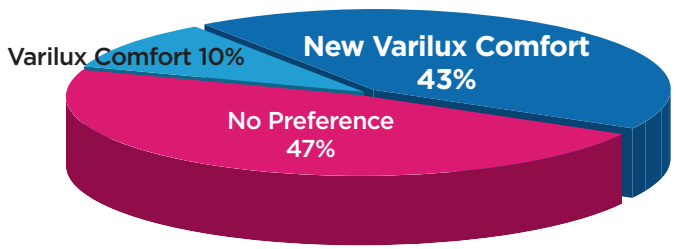
Over half of the population expressed a clear preference between the tested designs, with a statistically significant preference for New Varilux Comfort.

OVERALL PREFERENCE** **>4:1 preference**

STANDARDIZED EVALUATIONS

	New Varilux Comfort	Varilux Comfort	NP	*p*-value
Ease of changing focus (distance to near)	9	3	18	*0.15*
Ease of changing focus (intermediate to near)	13	6	11	*0.17*
OVERALL PREFERENCE**	**13**	**3**	**14**	***0.02***

Overall Preference



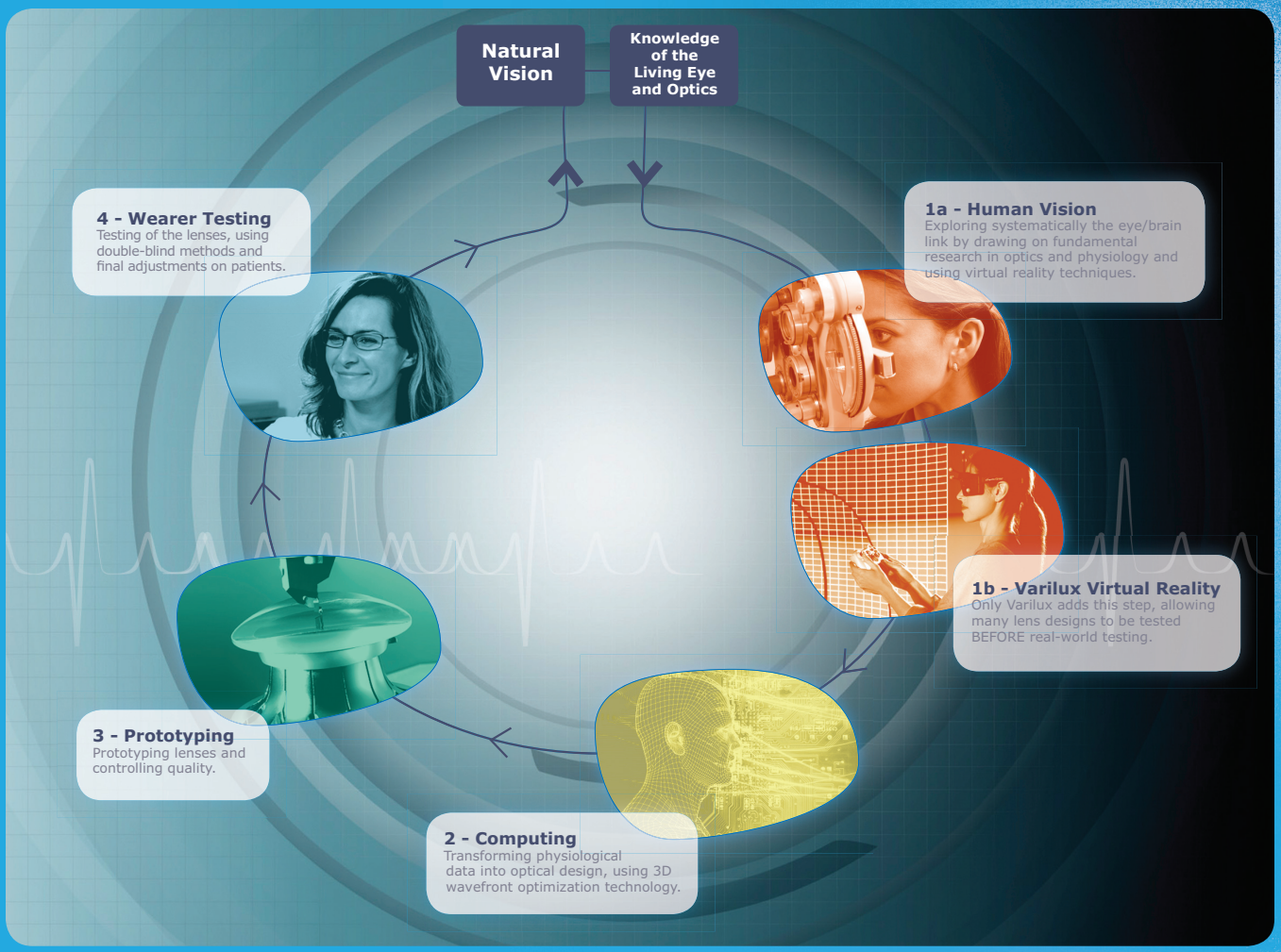
CONCLUSIONS

- The majority of subjects expressed a clear preference between the designs, with a statistically significant percentage favoring New Varilux Comfort.
- Subjects preferred New Varilux Comfort lenses **> 2 to 1** over Varilux Comfort for transitioning from intermediate to near.
- Subjects preferred New Varilux Comfort lenses **3 to 1** over Varilux Comfort for transitioning from distance to near.

New Varilux Comfort lenses were preferred 4 to 1 over original Varilux Comfort for overall performance.

Varilux® Live Optics

Only the Varilux® R&D process integrates the results of wearer testing at each stage of lens design, guaranteeing the highest level of patient satisfaction.



essilor

Seeing the world better

Essilor International is the world leader in the design, manufacture and customization of ophthalmic lenses. Active on five continents, Essilor offers a wide range of lenses under the flagship Varilux®, Crizal®, Definity®, Xperio® and Essilor® brands to correct presbyopia, myopia, hyperopia and astigmatism.