



## Identifying New Needs

### 1 Identified new needs of today's presbyopes using new testing methodologies

#### Wearer Studies

- Real-Life for 2-3 weeks
- Controlled, cross-over & double masked study
- Product evaluation through a validated questionnaire based on universal criteria (i.e. quality of vision)



Total of 19 separate wearer and usage studies (total n= 2,742).

\* Pr. José Sahel received no remuneration for validating these protocols

## Continually Improving PAL Design

Through the process of creating Varilux X Series™ lenses we have:

- 1 Identified new needs of today's presbyopes using new testing methodologies
- 2 Redefined performance of the near and intermediate zones of a PAL
- 3 Developed Xtend™ Technology

## Identifying New Needs

### 1 Identified new needs of today's presbyopes using new testing methodologies

#### Usage Studies

- House Lab : a controlled environment
- Single masked studies
- Product evaluation reproducing familiar tasks at arm's length



## Continually Improving PAL Design

**1 Human vision research**  
Using virtual reality, the eye/brain link is studied to determine the visual needs of each patient. Only Varilux lens designs are tested in this way before the wearer testing phase.

**2 Computing**  
Research data is transferred to the lens design. To achieve the highest performance, W.A.V.E. Technology™ is used to eliminate optical distortions.

**3 Prototyping**  
Test lenses are made using the patented Essilor Digital Surfacing Process Control for design accuracy.



**4 Wearer testing**  
The lens prototypes are tested by patients who provide feedback on the lens performance before final design.

## Identifying New Needs

### 1 Identified new needs of today's presbyopes using new testing methodologies

- **Movis**, an experimental lab where 3D cameras capture real time movement
- **Simulator** room recreates different visual environment and lens configurations



Simulator room



Movis, experimental lab

## Identifying New Needs

90% of our time is spent indoors, using intermediate and near vision<sup>1</sup>



<sup>1</sup>Ericsson, Optimizing the indoor experience (2013)

## Identifying New Needs

### Everyday tasks challenge vision...



- Multi-tasking
- Being Connected
- Being active around the home

Source: Consumer needs understanding - Qualitative research 2015 - 5 Focus groups France & US, ~30 Premium Progressive wearer

## Identifying New Needs

People associate near vision with personal space and highly emotional situations and rate it as very important.<sup>1</sup>



<sup>1</sup>Qualitative research- France & Spain (2015)

## Identifying New Needs

### Everyday tasks challenge vision...



**So much of our vision occurs WITHIN ARM'S REACH**

- Personal space
- Personal activities
- Modern devices
- Relationships
- Work

Source: Consumer needs understanding - Qualitative research 2015 - 5 Focus groups France & US, ~30 Premium Progressive wearer

## Identifying New Needs

Main limit of progressive lenses remain **POSTURAL ISSUES** finding the right zone

"I have to find the position with my head, there is kind of a little angle, I have to look for the right place on the lens"

"When I'm working on a screen, I have to lower my head - I assume it's something to do with the middle correction"

Source: Consumer needs understanding - Qualitative research 2015 - 5 Focus groups France & US, ~30 Premium Progressive wearer

## Identifying New Needs

### DID YOU KNOW?

**50%**

50% of PAL wearers are not "completely satisfied" with the visual comfort within arms reach

- at near distance
- at intermediate distance

Quantitative research 2015 Canada, 190 consumers  
<sup>1</sup>47% wearers not completely satisfied at near - 52% wearers not completely satisfied at intermediate distance  
<sup>2</sup>reading/working on their computer

## Identifying New Needs



## DID YOU KNOW?

HEAD SCANNING  
FOR CLEAR VISION

The main  
limitation of PALs  
is tied to postural  
issues and finding  
the right spot in  
the lens for vision\*

\*Consumers needs understanding – Qualitative research 2015 – 5 Focus groups France & US – 40 Premium Progressive wearers

## Redefining Near &amp; Intermediate



Thanks to studies of wearers' physiology and usage, R&D is able to more accurately define the visual needs for each task within arm's length



## Redefining Near &amp; Intermediate



## 2 Redefined the use and performance of the near and intermediate zones of a PAL

IN THE 90'S :

A SINGLE NEAR DISTANCE  
IN PLANE OF VIEW

Previously progressive design primarily considered near vision : one single plane for one single viewing direction (16" at 36 degrees)

IN 2017 :

MULTIPLE NEAR DISTANCES  
RESERVED AT ARM'S LENGTH

Today, we account for the full variety of visual needs at near. These multiple near distances correspond to a sphere between 16-28" at arm's length

## Xtend™ Technology



## 3 Developed Xtend™ Technology: only available in NEW Varilux X Series™ Lenses

## Wearer Benefits

- Wearers no longer need to find "just the right spot" to see sharply
- Dramatically reduces head movements
- Multiple distances through one point in the lens



Single-center study - Eurosyn - France (n=62).

## Redefining Near &amp; Intermediate



## What is "Arm's Length Vision?"

- The zone corresponding to the distance of 16-28" (60% of the ADD power)
- This is the exact position where Essilor R&D has concentrated the design improvement to meet the need for multiple targets within arm's length.



## Xtend™ Technology



Xtend™ Technology

### Progressive lenses **before** Xtend Technology

- Intermediate zone is a transition from far to near.
- Focus changes as gaze moves up and down the lens
- Each area of the lens provides a **single** focal length

Xtend™ Technology

### Progressive lenses **with** Xtend Technology

- Xtend™ Technology is a “game changer”
- Each area of the lens allows for multiple vision distances
- Larger intermediate AND larger near with optimal progression length

illustration

Xtend™ Technology

### Progressive lenses **before** Xtend Technology

- Near & Intermediate zones are a “zero sum” game
- Shorter progression = larger near, **smaller intermediate**
- Longer progression = larger intermediate, **smaller near**

Xtend™ Technology

### How does Xtend Technology work?

With Xtend Technology, each area of the lens provides a simultaneous range of focus.

Xtend Technology is a **NEW** approach to progressive design that **solves the problem!**

This new approach has **15 patents pending.**

illustration

Xtend™ Technology

### Progressive lenses **before** Xtend Technology

In **every other** PAL design, each point in the lens provides a single distance of vision...

Changing the progression moves **where** each point of focus is- but **does not solve the problem** of “finding just the right spot!”

Xtend™ Technology

### How does Xtend Technology work?

STANDARD OPTIMIZATION	XTEND™ TECHNOLOGY OPTIMIZATION
1 TARGET FOR 1 GAZE DIRECTION	MULTIPLE TARGETS FOR 1 GAZE DIRECTION
All other PALs are designed to manage one target object for one gaze direction	Xtend Technology significantly reduces the head movement required for the wearer to find the “right spot”



## Xtend™ Technology



## How does Xtend Technology work?



The simultaneous design concept is found in contact lenses.

Xtend Technology creates the same effect with sharper vision (because the simultaneous powers only vary by 0.12-0.50D).

## Varilux® X Series™ progressive lenses



INTRODUCING

**VARILUX** **X** **series**  
With new **XTEND**™

Extended arm's length vision without compromising near and distance vision

## Xtend™ Technology



## How does Xtend Technology work?

ONE GAZE DIRECTION, MULTIPLE FOCUS TARGETS



HEAD SCANNING  
FOR CLEAR VISION

MINIMAL HEAD MOVEMENT  
FOR CLEAR VISION

## Varilux® X Series™ progressive lenses



**VARILUX** **X** **series**

An unsurpassed solution to presbyopia...

- 5 years of Research & Development
- 19 wearer studies among thousands of wearers
- 15 new patents pending
- A completely new calculation process

## Xtend™ Technology



## How does Xtend Technology work?



## Varilux® X Series™ progressive lenses



**VARILUX** **X** **series**

An unsurpassed solution to presbyopia...

**Xtend**™ No more searching for "just the right spot"

**Nanoptix**™ No more "off-balance feeling"

**SynchronEyes**™ Smooth transitions from far to near

**W.A. V.E.™ Technology 2** Sharp vision even in low lighting  
(Wavefront Advanced Vision Enhancement)

Varilux® X Series™ progressive lenses



An unsurpassed solution to presbyopia...

Every benefit has been demonstrated in independent studies measuring lens performance on live patients.



7 OUT OF 10  
PREFERRED OVER  
Varilux S Series\*


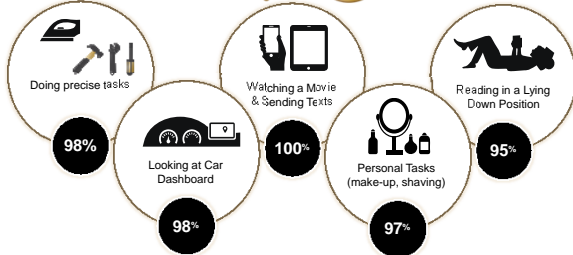
No other progressive lens delivers the combination of sharp, extended, comfortable vision to the presbyopic wearer.

Single-center study – University of Arkansas - USA (n=59).

Varilux® X Series™ progressive lenses




Varilux® X Series™ progressive lenses





Single-center study - Eurosyn - France (n=42). Wearers rated on a 10-point scale from "Not satisfied at all" to "Very satisfied". Satisfied responses ran from 7 to 10. Wearers rated satisfaction with focus for Multitasking activity.

Summary

- Essilor spends more on R&D than our top 3 competitors combined.
- "Variable corridor" PALs are a "zero sum" game – they do NOT solve the main complaint of PAL wearers.
- Xtend™ Technology is a completely new approach to near & intermediate that SOLVES the problem of "finding just the right spot."

Varilux® X Series™ progressive lenses



- Varilux X LDI**
  - PD, FH, position of wear, leading dominant eye, reading dist. (opt)
  - Visiooffice™ Required
- Varilux X design fit**
  - PD, FH, position of wear (defaults acceptable)
- Varilux X design**
  - PD, FH (MFH = 14mm)

As with all well-designed progressive lenses, optimal performance requires professional dispensing skills (fitment to pupil center).

Thank You



QUESTIONS?