

Deconstructing Advanced Progressive Lens Designs: A Stepwise Approach



Michelle J. Hoff, OD, FAAO, ABOM, FNAO
Associate Clinical Professor
University of California Berkeley
Herbert Wertheim School of Optometry and Vision Science
mhoff@berkeley.edu
mhoff@sightlineoc.com

1

Michelle J. Hoff, OD, FAAO, ABOM, FNAO




- ◆ University of California Berkeley | Associate Professor of Health Sciences
- ◆ Mindful Eyes Foundation | Founder and Executive Director
- ◆ SightLine Ophthalmic Consulting | Co-founder and CEO
- ◆ Doctor of Optometry (OD)
- ◆ Master in Ophthalmic Optics (ABOM)
- ◆ Registered Spectacle Lens Dispenser (CA-SLD)
- ◆ Licensed Optometrist (CA-DCA)



2

Disclosures

- The content of this course was developed independently without commercial bias or influence
- Consulting
 - Visionix
 - Essilor Instruments, USA
 - Topcon



3

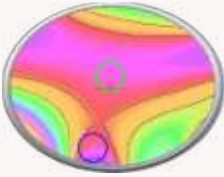


4

Learning Objectives

Progressive Lens DNA



- Surfacing
 - Traditional vs Digital Design Features:
 - Enhanced
- Design
 - Dual
 - All Back Surface
- Aberration
 - Hard vs Soft
- The Drop
 - Vertical Power Change



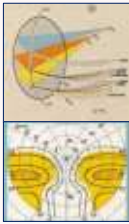
Review of manufacturers latest technology and product portfolios
Patient Case Review

5


Origins of the Modern PAL

Bernard Maitenaz
Patents 1953-1959



Design Improvements
1960-1970's




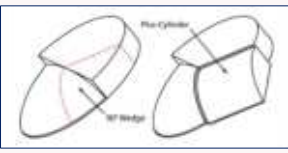
CAD Freeform, CNC Machines
1980-2020's

[The Competition for Leadership when the Market for Progressive Lenses became global.](#)

6

Basic Progressive Lens Design: Simple Yet Complex





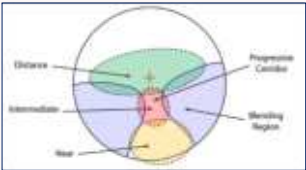
PAL

- A type of multifocal lens
- Increasing curvature = increased Plus power
- Variable focus intermediate zone
- Edges and lines are blended
- Oblique Plus cyl is blended in the periphery = Surface Astigmatism
- No image jump

Fundamentals of Progressive Lens Design Copyright © 2006 Darryl J Meister and Vision Care Product News

7

Four Structural Features to Manipulate




- Distance = stable area for distance Rx
- Near = stable area for near Rx
- Corridor = zone of increasing, plus power, provides mid-range vision
- Blending Region = contains varying amounts of Surface Astigmatism


Fundamentals of Progressive Lens Design Copyright © 2006 Darryl J Meister and VisionCare Product News

8


5 Key PAL Concepts




1. Surfacing: Traditional vs Freeform
How is the lens made?




2. Design: Front, Dual, All Back
Where is the prescription placed?



3. Aberration Pattern
What is the Surface Astigmatism distribution?



4. The Drop: FRP to PRP
What does it mean?



5. Vertical Power Change:
How can we control it?


9

Key Concept #1 Surfacing

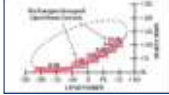


10

Surfacing TRADITIONAL PAL SURFACING




Tscherning's Ellipse
individual powers need separate base curves.

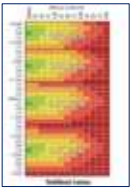


Optical compromise:

- Range of Rx grouped into one base curve
- reduces the number and cost of many molds



I need a 7.5
Store only stocks 7 or 8



Green = best vision
Yellow, orange, red = increasingly poor peripheral vision


Optical Lens Design by Danyf Meitner

11


Surfacing FREEFORM PAL SURFACING

NO MORE FORMS

Software Program

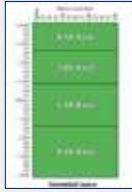


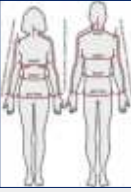
Digital Surfacer
moves in 3D, like a record player



Point by point surface profile

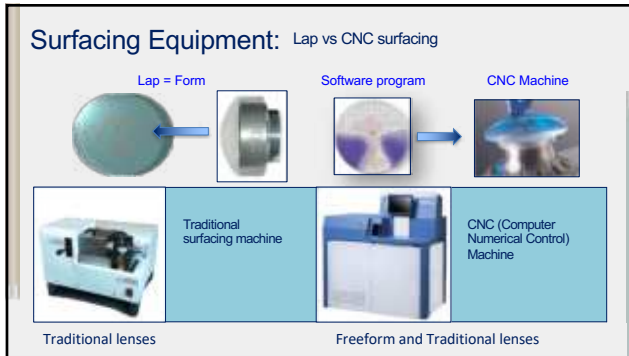
- RX
- Aberrations
- Position of wear



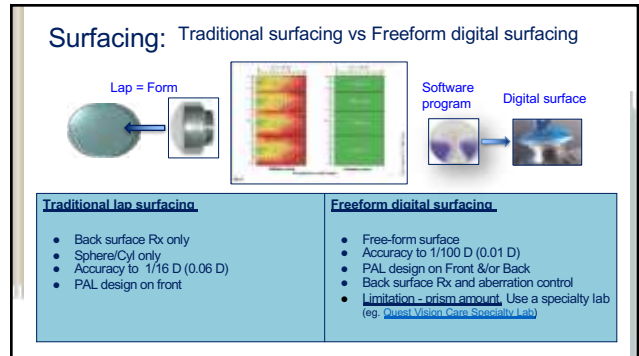


ALL prescriptions can be Optimized
Like a custom made dress or suit

12



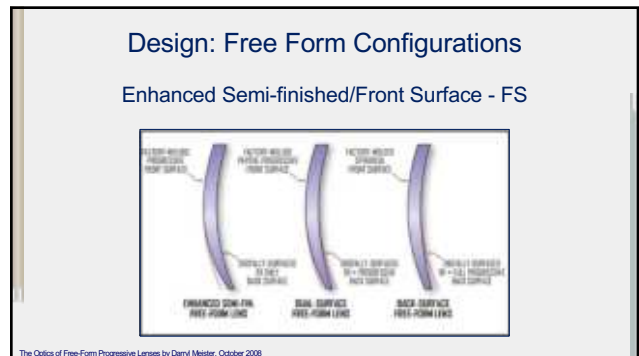
13



14

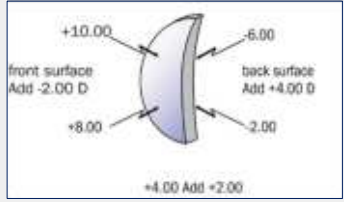


15



16

DUAL SURFACE DESIGN- DS



front surface Add -2.00 D

back surface Add +4.00 D

+10.00

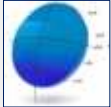
-6.00

+8.00

-2.00

+4.00 Add +2.00

- Aspheric front surface
- ~3.00D range
- Increased magnification at near
- Soft lens design
- Better cosmetics in high plus RX
- Preferred by hyperopes

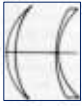


17

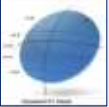
ALL BACK SURFACE DESIGN - ABS

Spherical lens forms

- Meridian (Hiltsche and Ginter)
- More Best with +1-3.00 BC



- Plus Rx:
 - Best Curve = 4.00 D on the back
- Minus Rx:
 - Best Curve = 6.00 D on the front

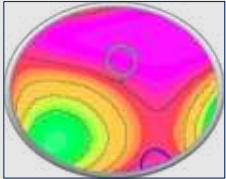


- Spherical front surface
- Rx on back of lens
- More types of lens options
- Not ideal cosmetics in high plus lenses
- Hard design
- Preferred by myopes

18

Key Concept #3

Abbreviations

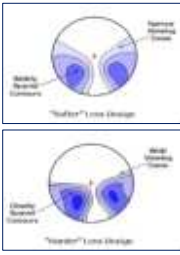


19

Off Axis Aberrations

All variable power lenses have off axis aberrations

- Contour lines = 0.50-0.75 DC
- Closer together = faster change
- Darker the blue = higher amount



2 Categories

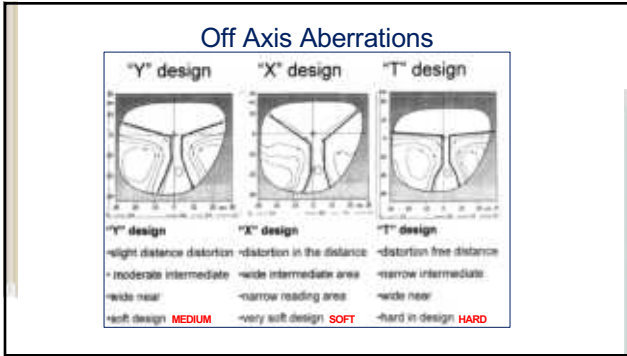
SOFT Distribution

- Spread out more
- Dual surfacing
- Hyperopes (generally)

HARD Distribution

- Concentrated below 180
- All back surfacing
- Myopes (generally)

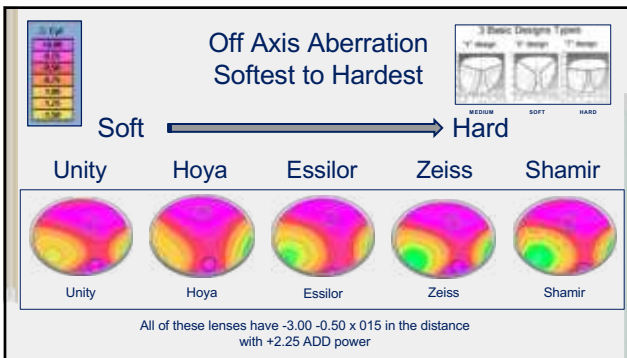
20



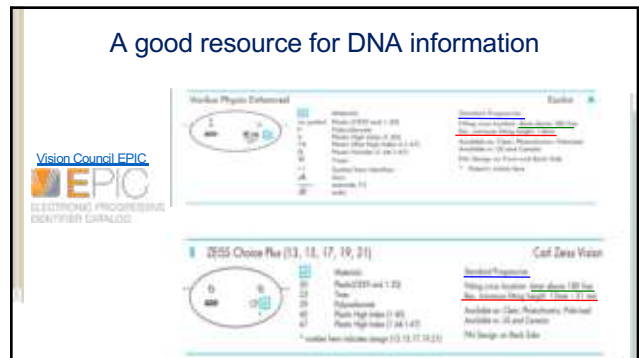
21



22

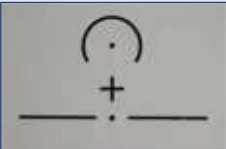


23



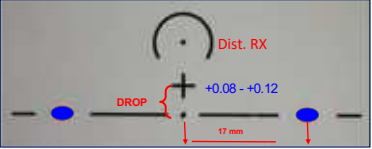
24

Key Concept #4 The Drop



25

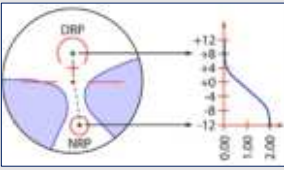
THE DROP:FRP (pupil) to PRP (180 line)



- Drop doesn't always indicate the beginning of the power change
- Older designs used to compensate for Martin's Rule of Tilt
 - Drop OC 1mm for every 2° panto angle
- Shortcut for marking up lenses w/o a layout chart

26

Key Concept #5 Vertical Power Change



27

Vertical Power Change

Definition of a Corridor


- There is no industry accepted definition of a corridor
- Common definition "Area where the power transitions from Dist to Near"

Lens designers

- Don't use the term "corridor"
- Prefer "Progression Length"
 - Area of the lens that contains 10% to 90% of the ADD power

Power Length (PL) is at the discretion of the lens designer

- Position
 - Bottom of DRC
 - Fitting Cross
 - Prism Ref. Point
- Length
 - Long or short
- Inset depends on reading habits or NPD



28

Vertical Power Change

3 Corridor Design Concepts: MFH, Variable, Fixed

Minimum Fitting Height: All PALs have a MFH. This is a key factor

Exterior of America - Varilux Comfort

- ★ Older Std PALs design concept
- 85% of ADD is at the top of the NRC
- To ensure 100% = MFH + 2mm

We don't measure corridor/progression lengths,
We measure Fitting Heights

29

SIDE BAR: Factors Affecting MFH

- Frame Shape
 - Pilot
 - Angular
- Bridge placement
 - Wide/thin nose
- Pupillary Distance
 - Narrow/Wide

All of these can benefit or take away from the MFH

30

Variable Corridor Design

Exterior of America - Varilux X

- ★ Used in FreeForm designs (ABS & DS)
 - Software chooses the longer corridor based on VFH
 - Limits to how long
- Longer power change for longer VFH, Shorter for shorter
- Use MFH + 2mm for your fitting height

31

Variable Corridor PAL with task specific priorities

- Prioritized designs available w/ Freeform software
- Allows some control of variable corridor
- Variable corridor may be the reason for non-Adapt?
 - change in B dimension, short to long
 - solution = refit with similar corridor length

32

Fixed Corridor Design

Example:
 Fit. Ht. = 20 mm
 Corridor = 15mm
 Last 5 mm = 100% ADD
 Max ADD = 10 mm
 Int = 15 - 5 = 10 mm

Specify on lab order

33

Fixed Corridor Examples

fixed 13
 6 mm
 2 mm Digression
 Fitting Height = 20 mm

34

Geometry 101: How much is your patient seeing?

Area of Clarity (inches) = $\frac{\text{Lens (mm)} \times \text{Working Distance (cm)}}{\text{Vertex (mm)} \times 2.54 \text{ cm/inch}}$

@ 40 cm: 1 mm = 1.2 inches
 @ 67 cm: 1 mm = 2.0 inches

Calculations are simplified and do not take into consideration the center of rotation or the power of the lens.

35

Sample Problem





Area of Clarity (inches) = $\frac{1 \times 55}{13 \times 2.54} = \frac{55}{33.02} = 1.67$ inches

Calculations are simplified and do not take into consideration the center of rotation or the power of the lens.

36

Vertical Power Change

Fixed Corridor PAL Concept			
<i>Example: 20mm fitting height, last 3 mm of corridor = 100% add</i>			
19mm corridor 4mm near	17mm corridor 6mm near	15mm corridor 8mm near	13mm corridor 10mm near
4mm = 4.8 inches	6mm = 7.2 inches	8mm = 9.6 inches	10mm = 12 inches

This is a stylized representation, area shape and size may vary depending on Rx and lens design

37

PRODUCT INNOVATION AND EVOLUTION



Rapid development



Best exercise equipment

Every industry strives to provide the most advanced products to today's consumer



38

Standard vs Free Form Design Evolution

Through R&D, computerization, and advanced machinery lens designers have:

- Decrease higher order aberrations resulting in wider sharper fields of view for all lighting conditions
- Optimize binocularity to provide similar images to each eye in all directions of gaze
- Compensate Rx for position of wear, as well as refractive error, age, amount of add, pupil size
- Decrease off axis aberrations to widen the intermediate and near zones







39

Software Design & Freeform Surfacing

Essilor


Hoya


Unity

Zeiss

Shamir

Same machine process





Customized PAL

Different software programs

40



41

Essilor Portfolio

Free Form PAL 2 Cat. N	Free Form PAL 1 Cat. O	Premium PAL 2 Cat. F	Premium PAL 1 Cat. J
Varilux XR Design Technology 14/4(DS)	Comfort Max Fit 14/4(DS)	Comfort Max 14/4(DS)	Comfort 2 17/4(FS)
Varilux X Design Technology Fit 14/4(DS)	Varilux X Design Technology 14/4(DS)	Comfort 2 Drx/Short 17/14/4(ABS)	Comfort 2 Short 14/4(FS)

Aberration
Soft, X = DS
Medium Soft, Y = ABS

MEDIUM SOFT HARD

42

Essilor Technology Comparison

TECHNOLOGY

- All Varilux® lens designs
- Digital Surfacing
- Harmful Blue Light® Protection (Essential Blue Series™)
- WAIVE Technology™
- WAIVE Technology 2™
- Binocular Monitor (Varilux® Physics® W31)
- SynchronEyes™ (Varilux® X Series™) ←
- WaveStar™ Technology
- Home™ Technology
- Personalized Measurements™

- Software calculates R/L Rx as matched pair
- Provides similar images to each eye
- Applied to all fields of gaze
- Improves binocular function

Caution: may be contraindicated with poor BV fcn.

43

Varilux XR Essilor Technology Review

Xtend Technology

- Optimizes intermediate zone for digital devices
- Wider FOV along power progression
- Decreased head movements for within arm's length viewing

XR-motion Technology

- Replaced SynchronEyes
- Software calculates R/L Rx as matched pair
- Provides similar images to each eye
- Applied to all fields of gaze
- Improves binocular function

Illustrates zones of interest and eye movement patterns between points of interest

44

Essilor Technology Comparison

PERSONALIZED MEASUREMENTS

XR Track requires EyeRuler 2 POW

Technology	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
MyBlue® XR Track	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
MyBlue® XR Design	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
MyBlue® 4 DS	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
MyBlue® Comfort Blue Fil	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Optimizes for down gaze and reading eye movements


Consult Manufacturer for complete product portfolio information

45

Hoya Portfolio

Free Form PAL 2 Cat. N CM (optional)	Free Form PAL 1 Cat. O	Premium PAL2 Cat. F	Prem PAL 1 Cat. J
iD MyStyle2 14/4(DS) Modern, Adventure, Detail, Stable	Array 2/ Wrap 11,13,15,17,V/L4(ABS)CM	Array 11,13,15,17,V/4(ABS)	Hoyalux GP Wide 18/4(FS)
iD LifeStyle3 11,12,13,14,V(L)(DS) Urban, Indoor, Outdoor		Summit ecp IQ 18/4(FS) Summit cd IQ 14/4(FS)	

Aberration
Soft X = DS
Medium Soft Y = ABS



46

Hoya Technology Comparison

HDVA Upgrade	MyStyle 2	MyStyle 2	LifeStyle 3
HDVA Upgrade	14/4	14/4	14/4
MyStyle 2	14/4	14/4	14/4
MyStyle 2	14/4	14/4	14/4
LifeStyle 3	14/4	14/4	14/4

id LifeStyle 3


id MyStyle 2

47

Hoya Technology Review

Binocular Harmonization (BHT)

73% of the population have a difference in refractive error between the eyes of 0.25D or more. ¹



- Unequal images sizes
- Vertical prism imbalance

Caution: may be contraindicated with poor BV fxn.

¹Hoya data in file. European progressive lens orders 2007-2013

48

Shamir Portfolio

Free Form PAL 2 Cat. N (CM optional)	Free Form PAL 1 Cat. O	Premium PAL2 Cat. F
Autograph Intelligence 11,13,15,18,V/4(ABS)	Autograph II 11,13,15,18,V/4(ABS)CM	Spectrum+ 14,16,18/4(ABS)
Autograph III 11,13,15,18,V/4(ABS)	Autograph II Attitude 18,15/4(ABS)CM	
Attitude III Fashion 18,15/4(ABS) Attitude III Sport 18/4(ABS)		

Aberration
Hard T = ABS

49

Progressive Lens Technology Comparison

SHAMIR

- Optimize near inset
- Provide Near Mono PDs

Design	Autograph Intelligence	Autograph II	Autograph III	Attitude	Spectrum+
Technology	SS++	SSS	SS	SS	S
Eyeprint Technology AI	SS				
Continuous Design	SS				
All Angles	SS				
Eyeprint Technology II		SS			
Horizontal Position	SS	SS	SS		SS
Vertical Center	SS	SS		SS	
As-Worn Sweath	SS	SS			
Eyeprint Technology			SS	SS	SS
As-Walk			SS		
Close-Up	SS		SS		

50

Shamir Technology Review

AGE MATCHED HEAD-EYE DATA

CLOSE-UP TECHNOLOGY™

- Age matched database of head & eye movements across visual distance range
- Combined w/ AI = customize design for dynamic eye movements

Benefits:

- Unequal near convergence
- Working dist. ≠ 40 cm

Aberration
Hard T = ABS

51

Zeiss Portfolio

Free Form PAL 2 Cat. N (CM optional)	Free Form PAL 1 Cat. O	Premium PAL 2 Cat. F	Premium PAL 1 Cat. J
SmartLife Individual (Bal) 13/6(ABS) SmartLife Individual (Bal) S(M,L)14,16,18/6(ABS)	SmartLife Pure (S,M,L) 14,16,18/6(ABS)	Choice 13-15-17-19/6(ABS)	Gradal RD 21/6(FS)
SmartLife Individual Int 13/6(ABS) SmartLife Individual Int S(M,L)14,16,18/6(ABS)	SmartLife Plus 13/6(ABS)	GT2/Short 17/13 /4(FS)	
SmartLife Individual Near 13/6(ABS) SmartLife Individual Near S(M,L)14,16,18/6(ABS)	SmartLife Superb 13/6(ABS)CM		

Aberration
Hard T = ABS

52

Zeiss Technology Comparison

Technology	Free Form PAL 2 Cat. N (CM optional)	Free Form PAL 1 Cat. O	Premium PAL 2 Cat. F	Premium PAL 1 Cat. J
SmartView Technology				
Smart Dynamic Optics				
Age Intelligence				

SmartView Technology


- Smart Dynamic Optics: Addresses binocular eye movements and Rx imbalances
- Age Intelligence: Factors in ADD power, pupil size for a given age.

53

Zeiss SmartLife Individual Technology Review


IndividualFit technology
Different design options for different lifestyles

Balanced
All zones optimized



Distance zone: ****
Intermediate zone: ***
Near zone: **


Intermediate
Active Lifestyle



Distance zone: ****
Intermediate zone: ****
Near zone: **

25% larger

Near



Distance zone: ***
Intermediate zone: **
Near zone: ****

30% larger




Available in Short, Medium, Long, or Var. Corridors

54

Unity Portfolio

Free Form PAL 2 Cat. N (CM optional)	Free Form PAL 1 Cat. O	Premium PAL 2 Cat. F	Premium PAL 1 Cat. J
Via Elite II 12/4(ABS)	Via Plus II 12/4(ABS)CM	Via II 12/4(ABS)	Ethos Plus 18/14/4/ABS
	Via Wrap II 12/4(ABS)CM		

Aberration
Medium Soft Y = ABS

3 Basic Design Types

55


Unity Technology Comparison

Technology	Patient Benefit	Unity Via II	Unity Via Plus II, Module II, Wrap II	Unity Via II
Advanced PB	Allows patient to easily find intermediately, near and preferred reading distance. Allows more natural posture and unimpeded visual ergonomics.	+		
Asphere (HFR)	Optimize Off axis Abber./Wider FOV	+	+	
Digital Viewport	Optimized prescription at every part of the lens. Minimized peripheral distortion.	+	+	
Disturbance (HFR)	Optimize R/L Rx/ Mag. & Prims Imbal.	+	+	+
OptScreen (HFR)	Optimize Int zone, Like Xtend / Age Intel	+	+	+
Automatic Reading Height Optimization	Each lens is customized for the individual patient ensuring that the full add power is fit inside the frame.	+	+	+
Variable Inset	Larger usable reading area.	+	+	+

56

IOT Portfolio


Private label lenses thru Independent Labs

Free Form PAL 3	Free Form PAL 2	Free Form PAL1	Specialty FF PAL
Camber Steady Plus Balanced 14-18/4(DS) Medium	Endless Steady Balanced 14-18/4(ABS) Medium	Essential Steady Balanced 14-18/4(ABS) Medium	Endless Pilot 14,16,18/4(ABS) Medium
Camber Steady Plus Distance 14-18/4(DS) Medium	Endless Steady Distance 14-18/4(ABS) Medium	Essential Steady Distance 14-18/4(ABS) Medium	
Camber Steady Plus Intermediate 14-18/4(DS) Soft	Endless Steady Intermediate 14-18/4(ABS) Soft	Essential Steady Intermediate 14-18/4(ABS) Soft	 <p style="font-size: x-small; text-align: center;">MEDIUM SOFT HARD</p>
Camber Steady Plus Near 14-18/4(DS) Medium	Endless Steady Near 14-18/4(ABS) Medium	Essential Steady Near 14-18/4(ABS) Medium	


IOT = Induzen Optical Technologies Minimum Fitting Heights can be specified or software driven


57

IOT Technology




Camber lens blank







Steady Methodology



Steady Plus Methodology



Digital Ray-Path 2



Personalized Parameters

58

IOT Technology Comparison

Technology	Essential Steady Good	Endless Steady Better	Camber Steady Plus Best
Camber			●
Steady Plus Methodology			●
Steady Methodology	●	●	
IOT Digital Ray- Path 2		●	●

59

IOT Endless Pilot Progressive

Innovative Technology



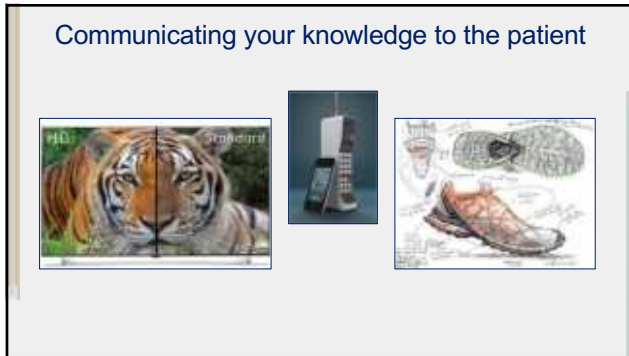


Endless Pilot Progressive



- Free Form Design
- All Back Surface
- 14, 16, 18mm MFH
- 4mm Drop
- Medium Aberration Pattern

60



61



62

What are you going to prescribe for Ted?

Ted is a 53 y.o M. Entertainment Attorney/Musician

LEE: 2 yrs.
CC: decreased Dist & Int vision
 Pt wears 2 pair of glasses (SVD and SVN)
 interested in all purpose glasses

Lensometry
Dist. Rx
 OD -2.75 -1.25 x 085 20/25
 OS -3.00 -1.50 x 085 20/25
Near Rx (Effective ADD = +1.50)
 OD -1.25 -1.25 x 085 .6M
 OS -1.50 -1.50 x 085 .6M

Spectacle Recommendations

- near task specific lenses = computer use
- general wear progressive = indoor
- CIV/PAL sunglasses.
- task specific musician glasses

Manifest Refraction
 OD -3.25 -1.25 x 085 20/15
 OS -3.50 -1.50 x 085 20/15
 Ted would like a frame that is similar to the one he wears.
 Fitting Height = 22 mm

63

Lens Portfolio

Frontline PBL (F)	Frontline PBL (F)	Frontline PBL (F)
Varilux XR 14	Varilux P Design 14	Premium PBL (F)
ADD General Use Individual, Individual 1, Individual 16 18 General Use Individual, Individual 1, Individual 16 18, 18, 18, 18	ADD Arma 2 11, 13, 15, 17, 18	ADD Varilux Comfort Max 14 Varilux Pylon Opti/Smart 13/14
ADD 12 Lenses 14 Outdoor/Indoor/Urban 11, 12, 13, 14, 16	ADD Arma 2 11, 13, 15, 17, 18	ADD OD -3.25 -1.25 x 085 OS -3.50 -1.50 x 085 Add +2.25 Fitting Ht. = 22mm
ADD 12 Lenses 14 Music/Performance/Stage 14	ADD Arma 2 11, 13, 15, 18, 19	ADD Arma 2 11, 13, 15, 18, 19 Arma 2 11, 13, 15, 18, 19 Arma 2 11, 13, 15, 18, 19
ADD 12 Lenses 14 Fashion 18, 19 Arma 2 11, 13, 15, 18, 19	ADD Arma 2 11, 13, 15, 18, 19	ADD Arma 2 11, 13, 15, 18, 19
ADD 12 Lenses 14	ADD Arma 2 11, 13, 15, 18, 19	ADD Arma 2 11, 13, 15, 18, 19

64

What are you going to prescribe for Debbie?

Debbie 48 y.o. F
First eye exam


CC: She doesn't like taking her glasses on and off and relies on them all day long.

Lensometry
+2.50 OTC for reading and computer
Work well for Int/Near, Takes off for Dist.

Unaided acuities
20/25- OD
20/25- OS

Manifest Refraction
OD +1.00 DS 20/20
OS +1.00 DS 20/20

BV, OH, SH: WNL/unremarkable.



65

Lens Portfolio

Prescription PBL 2 (R)	Prescription PBL 2 (L)	Prescription PBL 1 (R)
PRESCRIPTION Varilux XR 14	PRESCRIPTION Varilux X Design 14	PRESCRIPTION Varilux Control Max 14 Varilux Physix (Dist/Short) 1314
DESIGN SmartFit Individual, Individual 1, Individual 16, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18
DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18
DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18
DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18
DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18


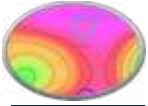
Rx
 OD +1.00 DS
 OD +1.00 DS
 Add +1.50
 Fitting Ht. = 28

66

Troubleshooting: Rx check for Debbie

CC
"My distance vision is great, but I have to tilt my chin up to see my computer clearly and to read."

How did we troubleshoot the case?

Custom Progressive Design
 PAL Design on Front and Back side
 Fitting cross-section shows more 180 lines
 Rx: individual fitting insight
 Class
 Available in: Progressive, Premium
 Available in: US and Canada

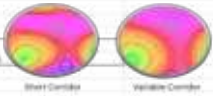
- Varilux X
- Freeform
- Dual Surface
- Soft Pattern
- Variable Corridor

67

Lens Portfolio

Prescription PBL 2 (R)	Prescription PBL 2 (L)	Prescription PBL 1 (R)
PRESCRIPTION Varilux XR 14	PRESCRIPTION Varilux X Design 14	PRESCRIPTION Varilux Control Max 14 Varilux Physix (Dist/Short) 1314
DESIGN SmartFit Individual, Individual 1, Individual 16, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18
DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18
DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18
DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18
DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18	DESIGN SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18 SmartFit Individual, Individual 1, Individual 16, 18, 19, 1, 18

Rx
 OD +1.00 DS
 OD +1.00 DS
 Add +1.50
 Fitting Ht. = 28



68

What are you going to prescribe for Walter?



Walter is a 50 y.o. M High School Principal
LEE: 2 yrs

CC "I am here to update my prescription, I have no problems with distance vision using my glasses, but I am having trouble reading with them".

Lensometry
OD +1.00 DS
OS +1.00 DS
ADD +1.50

Manifest Refraction
OD +1.00DS 20/15
OS +1.00DS 20/15
ADD +2.00

BV, OH, SH: WNL/unremarkable

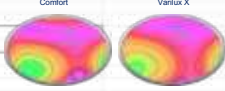



Standard Progressive
PAL Design on Front side
Fitting cross location: Area above 180 mm
Sec. minimum fitting height: 17mm
Available in: Clear, Photochromic, Polarized
Available in: US and Canada

69

Lens Portfolio

Prescription: PAL, F (R) PROG-DP Varilux XR 14	Prescription: PAL, F (R) PROG-DP Varilux X Design 14	Prescription: PAL, F (R) PROG-DP Varilux Comfort Max 14 Varilux Maxon D20/20mm 15/14
DESIGN SmartLife Individual, Individual 1, Individual W 10 SmartLife Individual, Individual 1, Individual W 10, M 10, L 10	DESIGN SmartLife Individual, Individual 1, Individual W 10 SmartLife Individual, Individual 1, Individual W 10, M 10, L 10	DESIGN SmartLife Individual, Individual 1, Individual W 10 SmartLife Individual, Individual 1, Individual W 10, M 10, L 10
ARRAY 12 UltraViolet (Ultraviolet) Filter 11, 12, 13, 14, 15	ARRAY Array 2 11, 12, 13, 14, 15	ARRAY Array 2 11, 12, 13, 14, 15
PROFILING Autograph Intelligence 11, 12, 13, 14, 15 Autograph 4 Pattern 18, 15 Autograph 4 Spot 18	PROFILING Autograph Intelligence 11, 12, 13, 14, 15 Autograph 4 Pattern 18, 15 Autograph 4 Spot 18	PROFILING Autograph Intelligence 11, 12, 13, 14, 15 Autograph 4 Pattern 18, 15 Autograph 4 Spot 18
SAFETY 100% UVB 11-12	SAFETY 100% UVB 11-12	SAFETY 100% UVB 11-12



70

What are you going to prescribe for Danny?

59 y.o. Grade School Teacher
Full time glasses wear, takes his glasses off to read


CC "Ever since I started using PAL's, my distance is not as sharp as before I needed PAL's. Is there something new that I can try?"

-2.50 DS OU 20/20 ODI/OS, add +2.50

BV, OH, SH: WNL/unremarkable

PAL history:
1st time PAL = Varilux Comfort
Followed by:
Varilux Comfort Enhanced
Varilux Physio Enhanced

Should we prescribe Varilux XR Design?





Varilux XR Design

Custom Progressive Design
PAL Design on Front and Back side
Fitting cross location: Area above 180 mm
Sec. minimum fitting height: 17mm
Available in: Photochromic, Polarized
Available in: US and Canada

71

Lens Portfolio

Prescription: PAL, F (R) PROG-DP Varilux XR 14	Zeiss SmartLife Individual	Varilux X Design
DESIGN SmartLife Individual, Individual 1, Individual W 10 SmartLife Individual, Individual 1, Individual W 10, M 10, L 10		
ARRAY 12 UltraViolet (Ultraviolet) Filter 11, 12, 13, 14, 15	ARRAY Array 2 11, 12, 13, 14, 15	ARRAY Array 2 11, 12, 13, 14, 15
PROFILING Autograph Intelligence 11, 12, 13, 14, 15 Autograph 4 Pattern 18, 15 Autograph 4 Spot 18	PROFILING Autograph Intelligence 11, 12, 13, 14, 15 Autograph 4 Pattern 18, 15 Autograph 4 Spot 18	PROFILING Autograph Intelligence 11, 12, 13, 14, 15 Autograph 4 Pattern 18, 15 Autograph 4 Spot 18
SAFETY 100% UVB 11-12	SAFETY 100% UVB 11-12	SAFETY 100% UVB 11-12

- Freeform
- ABS
- Hard Pattern
- Fixed or Variable

- Freeform
- Dual Surface
- Soft Pattern
- Variable Corridor

72

Contoured Prism Lens

Digital Eye Strain: a form of Trigeminal (CN5) Dysphoria

Hypothesized pathophysiological pathway

- Studied since 1800's
- Eye misalignment = overstimulates III nerve
- Headaches, Eye Strain, Neck & Shoulder pain

- 7-10 hrs/day digital device usage
- 59% Sx related to DD usage
- 17-38% Presbyopes have BV issues

73

Diagnostic Tools

DISTANCE MEASUREMENT		NEAR MEASUREMENT	
PRIMARY REFRACTIVE	0.00 D	NEAR ADD (CYLINDER)	0.00 D
SPH	1.00	SPH	1.00
CYLINDER	0.00 D	CYLINDER	0.00 D
AXIAL CYL	0.00 D	AXIAL CYL	0.00 D
VERTICAL MIP	0.00 D	VERTICAL MIP	0.00 D
	NEAR ADD		
	0.00 D		

NEURALOG VALUE
PRESBYOPES OD OS

74

NeuroLens Portfolio

3 Basic Design Types

NeuroLens PAL	NeuroLens Office
Free Form 18/2(ABS) Medium	Free Form 18/2(ABS) Near Task Specific

- Contoured BI Prism
- Increasing from Dist/Near
- SV, PAL, NTS

75

At the End of the Day

- Did I address the chief concern with the appropriate recommendations?
- Is it an improvement over what they are used to?

76

On behalf of Vision Expo, I sincerely thank you for being here this year.

Vision Expo Has Gone Green!

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE Letter for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.



Michelle J. Hoff, OD, FFAO, ABOM, FNAO Associate Clinical Professor mhoff@berkeley.edu mhoff@sightlinecc.com



77

At the End of the Day



- Did I address the chief concern with appropriate recommendations?
- Is what I am prescribing an improvement over what the patient has or is used to?

78

On behalf of Vision Expo, I sincerely thank you for being here this year.

Vision Expo Has Gone Green!

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE Letter for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.



Michelle J. Hoff, OD, FFAO, ABOM, FNAO Associate Clinical Professor mhoff@berkeley.edu mhoff@sightlinecc.com



79