Taking the Complication Out of Compensation

Presented by:
Bob Alexander, ABOM, NCLEM

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On behalf of Vision Expo, we sincerely thank you for being with us 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 Conference Advisory Board considers content and speakers for future meetings to provide you with the best education possible.

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Speaker Financial Disclosure

Bob Alexander has no financial interests to disclose.

4

Questions I receive most often?

Why are you changing the Rx?

Can you give me the formulas so I can work it backwards?

Do I verify against what was written or the compensation?

5

Objectives

At the end of this presentation, you will be able to:

- Recognize a compensated prescription and comprehend why it was performed
- Identify what frame fitting procedures can affect compensation
- Proper spectacle frame adjustments prior to obtaining fitting measurements for best compensation results

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Formulas

Formulas on the following slides are from:

'System for Ophthalmic Dispensing', Third Edition

- The Effects of Tilting Lenses pg. 410-411
- Induced Prism with Wrap Around Eyewear pg. 413

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Recognize a compensated Rx

8

Recognize a Compensated Rx

Compensated Rx
Rx that was ordered

vs.

Rx that was delivered

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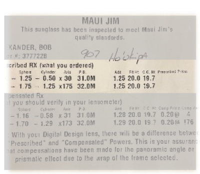
Recognize a Compensated Rx



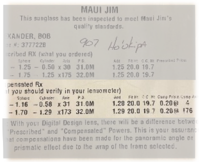
Compensated Rx
Rx that was ordered

vs.

Rx that was delivered

10

Recognize a Compensated Rx



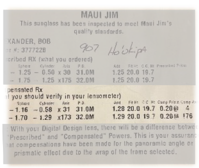
Compensated Rx
Rx that was ordered

vs.

Rx that was delivered

11

Recognize a Compensated Rx



Always neutralize to the compensation!

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Why is a compensation performed?

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Why was it performed?

Why does the Rx change?!

Or

Does it?

14

Why was it performed?

Back Vertex Power

The reciprocal of the distance in air from the rear surface of the lens to the second principal focus.

What you verify when neutralizing the lens in the lensometer.

Effective Power

That power lens required for a new position that will replace the original reference lens and yet maintain the same focal point.

What the patient experiences when wearing the lens.

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Why was it performed?

Back Vertex Power

This is what is *measured.*

Effective Power

This is what the wearer *perceives.*

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Why was it performed?

You ordered a 4.00D SV lens.

The invoice you receive states your lens is 4.00D.

During neutralization, with the power drum of your lensometer placed at 4.00D you see this image.

Would you pass this job?

17

Why was it performed?

You ordered a 4.00D SV lens.

The invoice you receive states your lens is 4.00D.

During neutralization, with the power drum of your lensometer placed at 4.00D you see this image.

Would you pass this job?

18

Why was it performed?

Back Vertex Power

Effective Power

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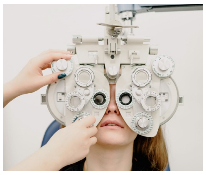
Why was it performed?

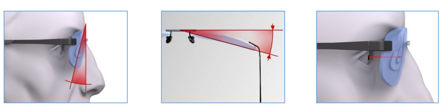


Fixed vertex
0^0 Pantoscopic Angle
0^0 Face Form
Small lenses
Looking through center

Glasses are prescribed like this . . .

20

Why was it performed?



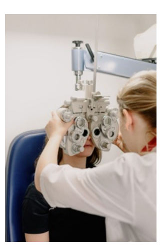
. . . but are worn like this.

21

Why was it performed?

Back Vertex Power
What is measured.

Back vertex formula - 1 / distance (m) = F (D)
1 / .25m = 4.00D
1 / 4.00D = .25m



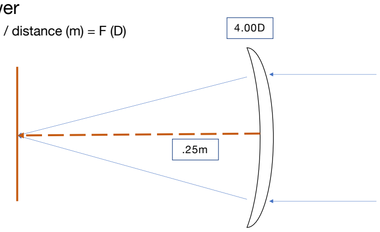
22

Why was it performed?

Back Vertex Power

Back vertex formula - 1 / distance (m) = F (D)

1 / .25m = 4.00D

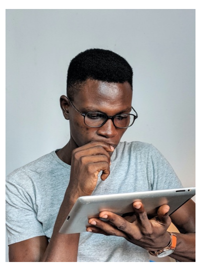


23

Why was it performed?

Effective Power

What the wearer perceives.



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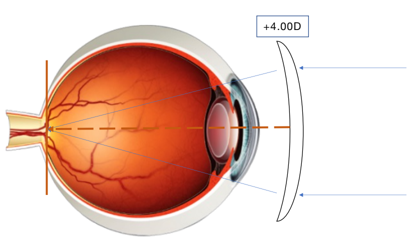
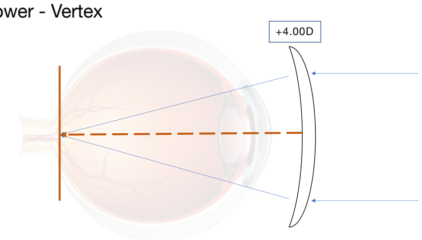
Why was it performed?



25

Why was it performed?

Effective Power - Vertex



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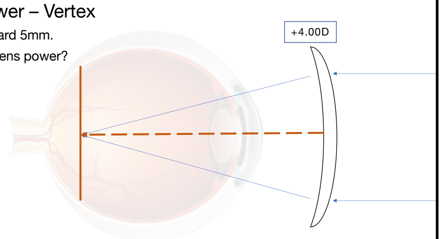
Why was it performed?

Effective Power – Vertex

Lens moved forward 5mm.

How will it affect lens power?



27

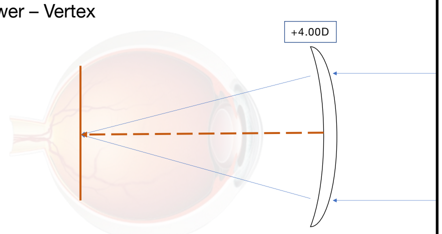
Why was it performed?

Effective Power – Vertex

5mm = .005m

.25 + .005 = .255

1 / .255 = 3.92D



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Why was it performed?

Effective Power – Vertex

5mm = .005m

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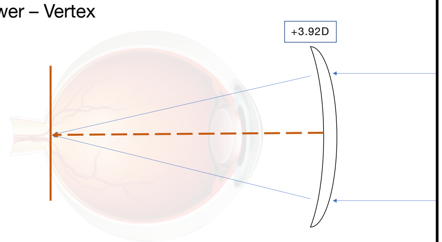
1 / .255 = 3.92D



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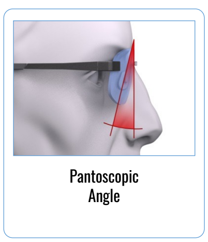
Pantoscopic Angle



Pantoscopic Angle

In the as worn position.

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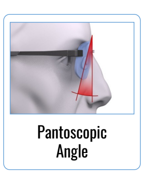
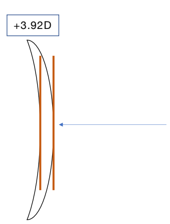
Why was it performed?

Effective Power – Pantoscopic Angle

Panto of 8º is added.

How will it affect lens power?





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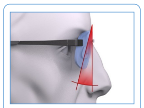
Why was it performed?

Effective Power – Pantoscopic Angle

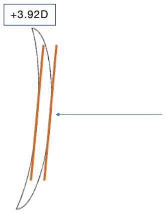
Panto of 8^{o} is added.

How will it affect lens power?



Pantoscopic Angle

+3.92D



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Why was it performed?

Effective Power – Pantoscopic Angle

Panto of 8^{o} is added.

How will it affect lens power?

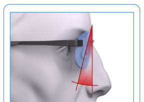
New lens power

$F_s = F(1+\sin^2 8^o / 2n)$
$F_s = 3.92(1+\sin^2 8^o / 2*1.53)$
$F_s = 3.92(1+\sin^2 8^o / 3.06)$
$F_s = 3.92(1+.0194 / 3.06)$
$F_s = 3.92(1+ .0063)$
$F_s = 3.92(1.0063)$
$F_s = 3.94D$

Induced cylinder

$F = \tan^2 8^o$
$F = 0.02$

+3.92



Pantoscopic Angle

33

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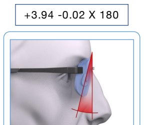
$F_s = 3.92(1+ .0063)$
$F_s = 3.92(1.0063)$
$F_s = 3.94D$

Induced cylinder

$F = \tan^2 8^o$
$F = 0.02$

+3.94 -0.02 X 180



Pantoscopic Angle

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Face Form (Wrap)

Wrap Angle
(ZTILT)

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Why was it performed?

Effective Power – Face Form

Face Form of 5^o

How will it affect lens power?

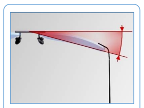
New lens power

$F_s = F(1+\sin^2 5^o / 2n)$
$F_s = 3.92(1+\sin^2 5^o / 2*1.53)$
$F_s = 3.92(1+\sin^2 5^o / 3.06)$
$F_s = 3.92(1+.0076 / 3.06)$
$F_s = 3.92(1+ .0024)$
$F_s = 3.92(1.0024)$
$F_s = 3.93D$

Induced cylinder

$F = \tan^2 8^o$
$F = 0.02$

+3.92D



Wrap Angle
(ZTILT)

36

Why was it performed?

Effective Power – Face Form

Face Form of 5^o

How will it affect lens power?

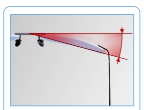
New lens power

$F_s = F(1+\sin^2 5^o / 2n)$
$F_s = 3.92(1+\sin^2 5^o / 2*1.53)$
$F_s = 3.92(1+\sin^2 5^o / 3.06)$
$F_s = 3.92(1+.0076 / 3.06)$
$F_s = 3.92(1+ .0024)$
$F_s = 3.92(1.0024)$
$F_s = 3.93D$

Induced cylinder

$F = \tan^2 5^o$
$F = 0.01$

+3.93 -0.01 X 090



Wrap Angle
(ZTILT)

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Face Form (Wrap)

Wrap Angle
(ZTILT)

Wrap Angle - Produces another concern.

What is it?

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Induced Prism

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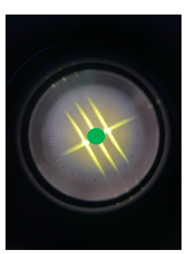
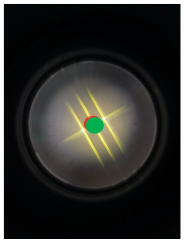
Induced Prism



40

Induced Prism



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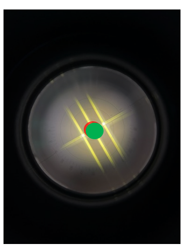
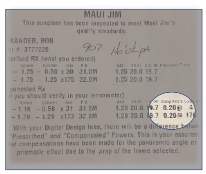
Induced Prism





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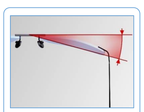
Induced Prism

Induced Prism is dependent on:

- Angle of tilt
- Base Curve (BC)
- Index of refraction
- Lens thickness

Prism base direction is opposite of where light enters the lens compared to the optic axis.



Wrap Angle (ZTILT)

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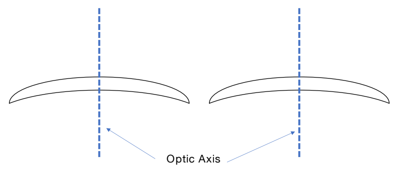
Induced Prism

Prism base direction is opposite of where light enters the lens compared to the optic axis.



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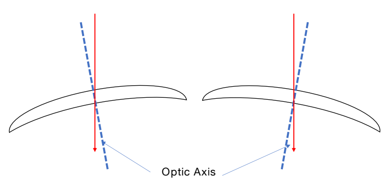
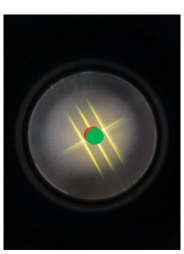
Induced Prism

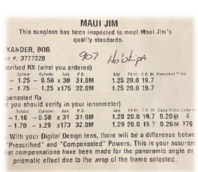
Prism base direction is opposite of where light enters the lens compared to the optic axis.



45

Induced Prism





MAUI JIM

This sunglass has been inspected to meet Maui Jim's quality standards.

EXANDER, BOB
or #: 3777228 907 Ho'okipa

scribed RX (what you ordered)

Sphere	Cylinder	Axis	P.D.	Add	Fit Ht	O.C. Ht	Prescribed Prism
− 1.25	− 0.50	x 30	31.0M	1.25	20.0	19.7	
− 1.75	− 1.25	x175	32.0M	1.25	20.0	19.7	

pensated Rx
al you should verify in your lensometer)

Sphere	Cylinder	Axis	P.D.	Add	Fit Ht	O.C. Ht	Comp Prism	Comp
− 1.16	− 0.58	x 31	31.0M	1.28	20.0	19.7	0.20@	4
− 1.70	− 1.29	x173	32.0M	1.29	20.0	19.7	0.20@	176

: With your Digital Design lens, there will be a difference betwe "Prescribed" and "Compensated" Powers. This is your assuranc hat compensations have been made for the panoramic angle or prismatic effect due to the wrap of the frame selected.

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Induced Prism

Effective Power – Wrap induced prism

Face Form of 5^{o}

How much prism is induced?

$P = 100 \tan 5^{0} (t / n)$ BC	Induced prism
$P = 100 \tan 5^{0} (.005 / 1.53)\ 5$	0.14D BO per eye
$P = 100 * .0875\ (.0033)\ 5$	0.28D total
$P = 8.75\ (.0033)\ 5$	
$P = .14$	

Wrap Angle (ZTILT)

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Theory – A supposition or a system of ideas intended to explain something, especially one based on general principles independent of the thing to be explained.

Bing.com

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Theory

All formulas discussed use the ‘thin lens formula’.

We don’t dispense thin lenses.

Formulas can’t be combined.

We cannot use ‘thin lens formulas’ to derive the same compensation models available by your lab.

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How frame fit affects compensation.

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Frame Fit

Do you know default measurements?

- Vertex
- Panto
- Wrap

Are you providing actual measurements?

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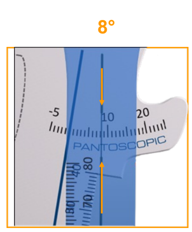
Frame Fit

Complete adjustments prior to taking measurements

- Did you adjust for proper panto?



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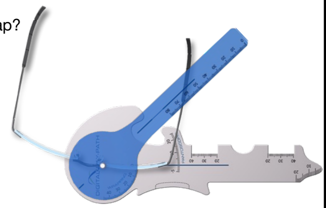
Frame Fit

Complete adjustments prior to taking measurements

- Did you adjust for proper wrap?



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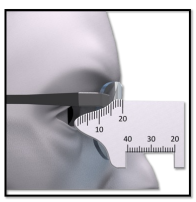
Frame Fit

Complete adjustments prior to taking measurements

- Did you adjust for proper vertex?
  - Do you know the refraction vertex?



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Troubleshooting

Adjustments during troubleshooting

- Panto
  - Effectively moves Fit Height
  - Induces cylinder at 180
- Faceform
  - Effectively moves PD
  - Induces cylinder at 090
  - Induces BO prism
- Vertex
  - Further than refraction = more plus power
  - Closer than refraction = less plus power

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What lens design are you using?

Are you using a dress wear design?

Or

Are you using a wrap design?

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Objectives

At the end of this presentation, you will be able to:

- Recognize a compensated prescription and comprehend why it was performed
- Identify what frame fitting procedures can affect compensation
- Proper spectacle frame adjustments prior to obtaining fitting measurements for best compensation results

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Taking the Complication Out of Compensation

Presented by:
Bob Alexander, ABOM, NCLEM

Thank You!

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