Compensated Powers
(and other ophthalmic conundrums)

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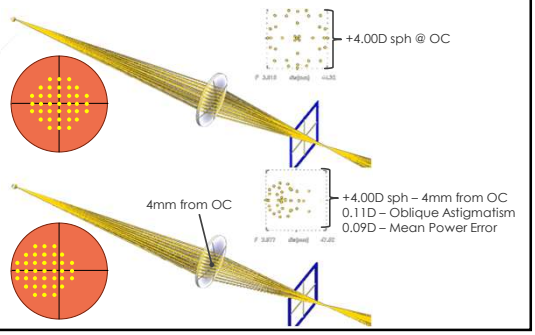
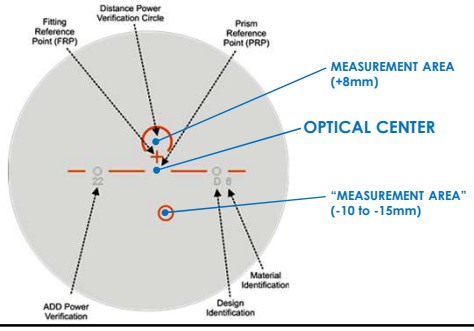
VISION EXPO

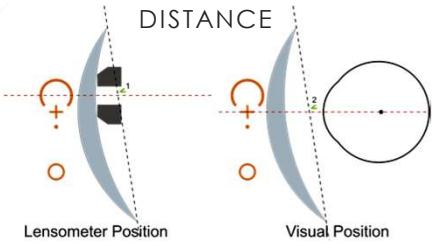
Same Lens- Different Results



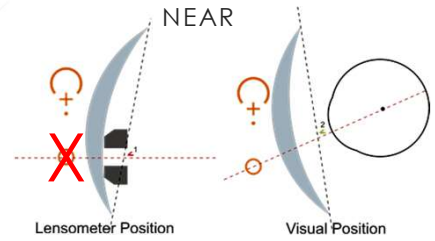
PALs are not measured @ OC



PALs are not measured "in position"



PALs are not measured "in position"



Measured vs. Worn Conditions

ANGLE (°)	SPHERE (D.)	CYLINDER (D.)	AXIS (°)
0	4.00	0.00	-
3	3.99	0.01	90
6	3.94	0.04	90
9	3.87	0.10	90
12	3.77	0.17	90
15	3.64	0.27	90

Measured focimeter powers of an as-worn +4D. SV calculated lens taking into account a tilt of ANGLE.

Has the power really been "compensated" (changed)?
No. The lens is still a +4.00 sph.
"Compensated" power indicates how the lensometer will see the lens.

Methods of Measurement

+5.00 -4.00 x 090 FOA vs IOA (CV)

	Min. sphere (D.)	Max. sphere (D.)
FOA	1.03	5.06
IOA	0.99	4.98
Discrepancies (FOA – IOA)	+0.04	+0.08

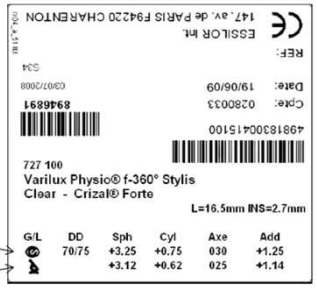
ADD measurement discrepancy FOA (CV v CX)

		Convex	Concave
Mean sphere (D.)	Far vision	3.05	2.92
	Near vision	5.72	5.40
Addition		2.48	2.67
Discrepancies (Concave – Convex)		+0.19	

ADD measurement discrepancy IOA (CX v Wearer)

		Convex	Wearer
Mean sphere (D.)	Far vision	2.95	3.05
	Near vision	5.46	5.90
Addition		2.51	2.84
Discrepancies (Wearer – Convex)		+0.33	

Measured power ≠ ordered power

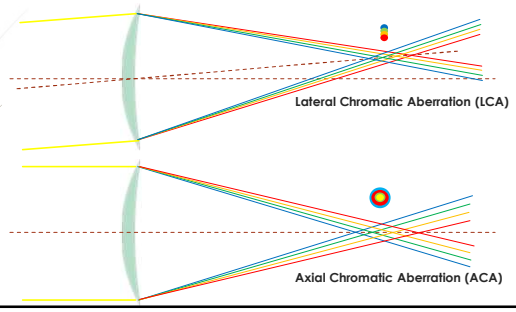


Compensated Powers

"Compensation" does NOT change the ordered power…

…compensation indicates how the ordered power will be seen by the lensometer!

What is Chromatic Aberration?



Abbe Value and Chromatic Aberration

Abbe Facts (Fabbies ☺)

- Plano lenses produce ZERO chromatic aberration
- No LCA at the optical center- regardless of power (if blur occurs looking straight ahead, its not LCA)
- Human eye has >1.00 diopter of ACA
- Studies show >0.12D CA may be noticeable to some (>3.75D of power/prism is required for 0.12D CA)
- If patient non-adapts to poly, but accepts 1.67… the problem was NOT chromatic aberration
- AR does NOTHING to reduce chromatic aberration

Abbe Value and Chromatic Aberration

Abbe Facts (Fabbies ☺)

- Studies show >0.12D CA may be noticeable to some

CR-39 (58) = 0.06Δ LCA = 20/21
Trivex (44) = 0.09Δ LCA = 20/22
Polycarb (30)= 0.13Δ LCA = 20/23
1.60 MR-8 (41)= 0.09Δ LCA = 20/22
1.67 MR-7 (32)= 0.12Δ LCA = 20/23

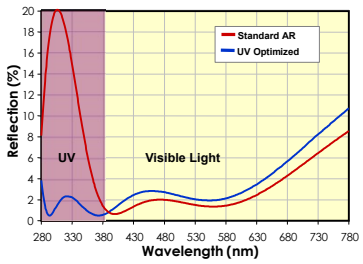
LCA = $\frac{3.75}{\frac{\text{PRISM}}{\text{ABBE}}}$

Chromatic Aberration is NOT an issue in ANY material (for 93.7% of wearers at least)!

LATERAL CA	VISUAL ACUITY
0.05 Δ	20/21
0.10 Δ	20/22
0.15 Δ	20/24
0.20 Δ	20/26
0.25 Δ	20/28
0.30 Δ	20/31
0.35 Δ	20/34
0.40 Δ	20/39
0.45 Δ	20/44
0.50 Δ	20/51
0.55 Δ	20/60
0.60 Δ	20/75

Effect of Chromatic Dispersion of a Lens on Visual Acuity.
Meslin, D. & Obrecht, G.
Am. J. of Optom. & Physiol. Optics, 65:25-28, 1988.)

No-Glare & UV



Imagine the result if a no-glare coating created UV reflections IN PHASE with each other…

5.1 General

Both uncut and edged finished lenses shall meet the following requirements. For lenses produced with compensations to account for as worn correction, the tolerances in the tables in clause 5 apply to those values specified by the manufacturer and not to the prescribed RX.

5.1.1 Distance Refractive Power (Back Vertex Power)

5.1.1.1 Single Vision and Multifocal Lenses

Table 1 – Tolerance on Distance Refractive Power (Single-Vision and Multifocal Lenses)

Sphere Meridian Power	Tolerance on Sphere Meridian Power	Cylinder ≥ 0.00 D ≤ - 2.00 D	Cylinder > - 2.00 D ≤ - 4.50 D	Cylinder > - 4.50 D
From - 6.50 D to + 6.50 D	± 0.13 D	± 0.13 D	± 0.15 D	± 4%
Stronger than ± 6.50 D	± 2%	± 0.13 D	± 0.15 D	± 4%

5.1.1.2 Progressive Addition Lenses

Table 2 – Tolerance on Distance Refractive Power (Progressive Addition Lenses)

Sphere Meridian Power	Tolerance on Sphere Meridian Power	Cylinder ≥ 0.00 D ≤ - 2.00 D	Cylinder > - 2.00 D ≤ - 3.50 D	Cylinder > - 3.50 D
From -8.00 D to + 8.00 D	± 0.16 D	± 0.16 D	± 0.18 D	± 5%
Stronger than ± 8.00 D	± 2%	± 0.16 D	± 0.18 D	± 5%

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