

Are Your Patient's More Up-to-Date Than You?

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Pure Optics, LLC

About the Speaker

Phernell Walker, II, MBA, NCLC, ABOM

- Master in Ophthalmic Optics
- Master in Business Administration
- Bachelor of Science in Business
- Associate of Science in Opticianry
- ABO Certified
- NCLE Certified
- Author of text-book, *Pure Optics*
- Joe Bruneri Award in Optics, Association of Schools Colleges of Optometry
- Beverly Meyers Achievement Award in Ophthalmic Optics



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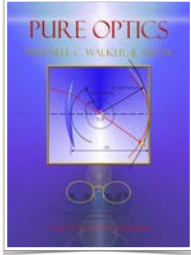
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References:

Pure Optics
by
Phernell Walker, II, MBA, ABOM



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Eyecare Party Misconception



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Reality



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21Century Eye Care Professional



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The Art of Eyewear



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Vehicles of Influence

Social Media
Face Book
TV
Patient's Rx
Desire
Fashion Appeal
Occupation
Needs



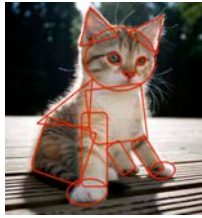
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Frame City



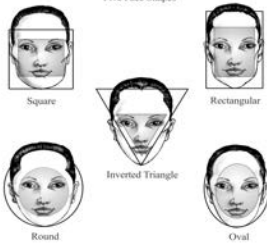
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Subliminal Shape Secrets



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Five Face Shapes



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Three Keys to Frame Selection

- Shape should contrast with face shape
- Size should be in scale with face size
- Eyewear should balance personal proportion

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Would You Order Lisinopril Based on this Machine?



What Do People Care About?

- Form
- Fit
- Fashion



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Is Your Frame Gallery a Cemetery?




Wearable Technology



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Wearable Technology Gone Bad



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Sustainability

- Recycle
- Repurpose
- Reuse



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Vinyl



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Repurposing



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3D Printing

3D Printing allows opticians to:
design
Print their own unique frames designs



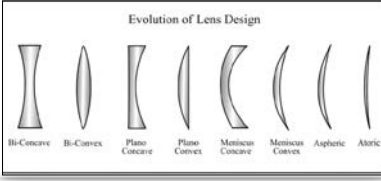
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Making Lenses Sexy: One Pair at a Time

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Progress in Motion

Evolution of Lens Design

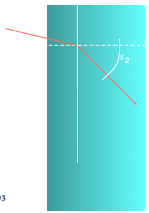


Bi-Concave Bi-Convex Plano Concave Plano Convex Meniscus Concave Meniscus Convex Aspheric Atoric

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Substrate's Refractive Index

Air	n = 1.001
Water	n = 1.336
Cornea	n = 1.376
CR39	n = 1.498
Lens Crown	n = 1.523
Trivex	n = 1.530
Mid-Index Plastic	n = 1.537 to 1.559
Polycarbonate	n = 1.586
Hi-Index Plastic	n = 1.600
Hi Crown	n = 1.604
MR-Series Plastic	n = 1.665 to 1.70
Super Hi-Index Plastic	n = 1.71 to 1.74
Super Hi-Index Glass	n = 1.706, 1.800, 1.893



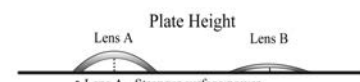
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How High is Too High?



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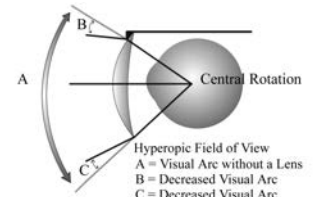
Surface Power



- Lens A - Stronger surface power
Steeper radius of curvature
Shorter radius of curvature
- Lens B - Weaker surface power
Flatter radius of curvature
Longer radius of curvature

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Decreased Visual Field



Hyperopic Field of View
A = Visual Arc without a Lens
B = Decreased Visual Arc
C = Decreased Visual Arc

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Toric Tangential Geometry

Radial Astigmatic Error

Tangential Foci Radial Error Sagittal Foci

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Aspheric Sagittal Geometry

Improved clarity over spherical lenses, but not perfect

+0.30 +0.25 +0.12 -0.0

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Atoric Tangential Geometry

Atoric lenses use linear asphericity tangentially
Results in optimized vision in every meridian

Rotationally symmetric

Aspheric + Aspheric = Atoric Back

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Toric Geometry

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Sunwear Technology

Polarized Top Choice
 Amber / Brown = superior optics
 Thin Film substrate matching
 Dielectric reflectance



Mirror Magic

Dielectric - deposited onto the lens surface at a thickness of 1/2 wave length to achieve maximum reflectance.



Design Elements



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Eliminating Specular Reflection

The light reflected from the surface of an ophthalmic lens is termed *specular reflection*. The amount of reflection produced depends on the regularity and refractive index of the lens. Fresnel's formula (Augustin Jean Fresnel, *fra-nel, 1788- 1827) can be used to determine the percentage amount of light reflected from each lens surface.

where:

- SR = Specular Reflection
- n = refractive index
- i = constant
- 100 = constant (converts answer into percentage form)

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Example:

What is the percentage of specular reflectance from each surface of a -2.00 DS lens made of crown glass (1.523n)?

Solution:

$$SR = \left[\frac{(n-1)^2}{(n+1)^2} \right] 100 \quad SR = \left[\frac{(1.523-1)^2}{(1.523+1)^2} \right] 100$$

$$SR = \left[\frac{.523^2}{2.523^2} \right] 100 \quad SR = \left[\frac{.273}{6.365} \right] 100$$

$$SR = \left[.04 \right] 100$$

$$SR = 4\% \text{ per surface}$$

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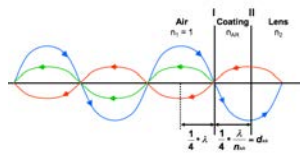
Optics of Thin Film

- Nano-optics (wave optics)
- Controlling light into the nano-meter
- Broadband Array
- Match reflex color / tone to the frame
- Blue Light filtering designs
- Health benefits related to AMD



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Thin Film Optics



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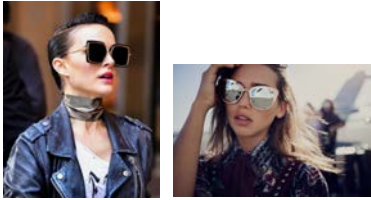
A Quiet Frame Revolution

A quiet frame revolution in frame has transformed today's eyewear into a unique blend of cutting edge and art for the eyes.



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Its All About You!



Eyewear Art

Ophthalmic frames are available in a variety of shapes, sizes, colors, designs and materials, several factors must be understood to ensure proper dispensing.





Innovation



Whats the Point of Progress?

- Expand design possibilities
- Better performance
- Greater convenience
- Higher level of satisfaction



Visible Progress



History of Frame

- Development of Frame materials
- Gold/ Silver/ Bone/ Ivory/ Wood
- Challenges with early materials/ limitations
- Evolution of frame/ design
- Technology used to produce frame materials/ evolution




Raw Material

- The first ophthalmic frame materials were made of lead, wood and copper.
- Later opticians used bone, leather and horn.

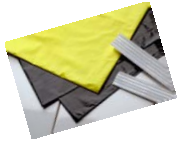


Plastics
Close
Up




Cellulose Acetate

- Most common plastic material
- Referred to as zylonite or zyl
- Combination of cottonseed and wood flakes
- Popular due to its wide selection of colors, patterns, and textures.



Manufacturing Methods


- Zyl is manufactured in large sheets similar to a 4'x 8' sheet of wall paneling.
- The sheets are cut into rectangles and then processed to make a frame style.



Zyl at Work

Pro's:	Con's:
<ul style="list-style-type: none"> ● Relatively inexpensive to produce ● Easy to adjust ● Malleable for lens sizing errors (zyl can shrink or stretch) 	<ul style="list-style-type: none"> ● Becomes brittle with age ● Color fading (not color fast) ● Increased waste is produced since zyl is cut from sheets rather vs. molded


Pizzaz



Grilamid - The Replacement for Zyl


- Nylon Blend
- Manufactured in molds
- Molding yields less waste vs. sheet cutting
- Zero shape limitations
- Molding provides design, style,
- Color Fast - coloring (tints will last for the life of the frame without fading), and manufacturing capabilities that sheet cutting can't.

Amazing Color



Grilamid Nylon Blend

- Nylon can become brittle and dry with age, thus making it easy to crack or break
- The addition of grilamid gives added strength and stability to the nylon-based material and helps preserve the life of the frame



Optyl

The number one plastic material best known for its vast brilliant colors and memory capability is Optyl, which is a vacuum-injected epoxy resin with several attributes compared to zyl.

Optyl is hypoallergenic, weighs 30% less than zyl, and will not burn in a saltpan.

Cellulose Propionate

Injection-molded

Requires only a small amount of heat for adjusting.

Ideal for parabolic shapes (i.e. sunglasses, wrap-around, and exotic shapes).



ALUMINUM IS BACK



NICKEL

- Common base material
- Excellent structural integrity
- Not hypo-allergenic and can cause skin irritation
- Metal corrodes
- Modern frame designers avoid using nickel whenever possible



MONEL

- Common non-corrosive
- Resilient metal
- 2/3 nickel
- 1/3 copper
- Iron
- Zinc
- Excellent tensile strength
- Economical to produce
- Works well for most frame shapes (curves or geometric angles)



STAINLESS STEEL

- Naturally hypoallergenic
- Works well with many frame shapes
- Composed of iron and chrome
- Corrosion Resistant
- Excellent structural integrity
- Economical to produce
- Alternative to nickel

Stainless Style



Stainless Steel

- The strength of stainless steel allows manufacturers to design very thin temples and frame fronts.
- This reduces the weight and surface area needed for stability creating a more cosmetically appealing product.

Bronze

Bronze is composed of:

- 92% bronze
- 6% tin
- 2% miscellaneous metals.

It is lightweight, corrosion resistant, and strong. Though bronze contains a small amount of nickel, it is only 0.3%, compared to 63% for monel, and therefore is considered nickel-free. This makes bronze an excellent choice for patients who have skin allergies to nickel.

Beryllium-Copper

- Lighter than aluminum
- More rigid than steel
- Silver-gray metal alloy
- Popular as a premium frame material
- Common in sunglass frames
- Corrosion resistant and strong
- Mixing beryllium with copper is more cost effective for manufacturers than pure beryllium

Pure Titanium

- Extremely lightweight
- Thin surface area
- Less weight
- High tensile strength
- Superior durability
- Nickel-free
- Hypoallergenic
- Comfortable to wear
- Corrosion resistant
- Looks great for years
- Resists breaking
- Electrolytic coloring
- Wide & resilient color assortment

Titanium Standard

American Society for Testing and Materials (ASTM) requires that pure titanium frames be marked TITANIUM -100.

Furthermore, pure titanium frames must contain 90 to 100% titanium by weight (excluding temple covers, hinge screws, and nose pads), titanium grades 1-4.

Magnesium

- Extremely lightweight
- 30% lighter than titanium
- 2/3 the density of aluminum
- Strong
- Flexible due to its dense hexagonal crystalline type structure
- Easy to manufacturing.



Wood

Not the kind that grows in your back yard.



Exotic Wood

Rare South American, amourette wood, also known as snake wood, because of its similarity to snake skin.

- Amourette Wood:
- dense
 - strong
 - grows in French Guiana
 - used in violin bows and fine jewelry and now in modern frame technology.



Hot or Not?

- Large oversized frames
- Shiny metallic frame colors
- Full rimmed plastic
- Loud decadent embellishments
- Flash dielectric mirrors
- One piece shields
- Large visible name brand



Hot or Not?

- Small conservative styles
- Pastels
- Rimlon/ mono-filaments
- No embellishments
- Clear Lenses
- Hidden Logos



All Around Us - Retro is in the Air



Over-Sized / Over Served Culture



Digital Technology



Embellished Temples



Pizazz




TRIFECTA - CHIC, URBAN AND SPORTY



Questions & Answers





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